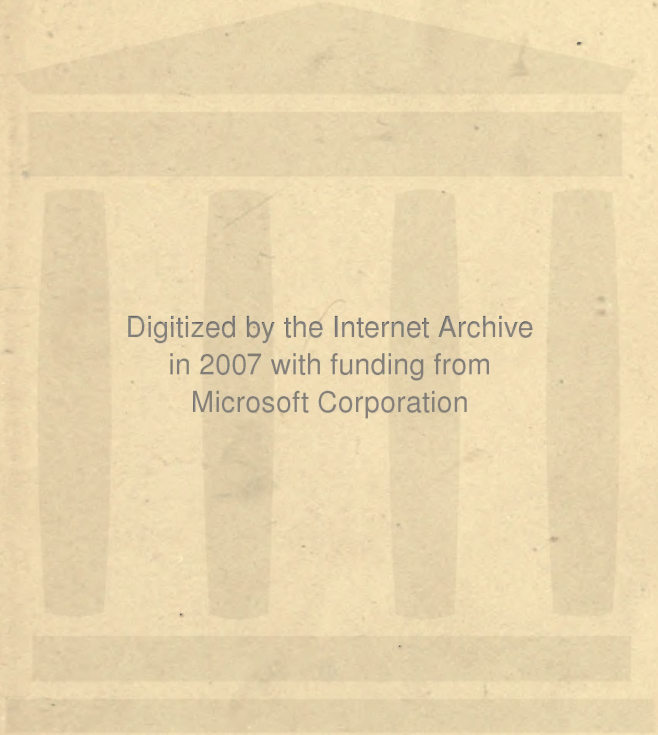
THE UNITED STATES THE TWENTIETH CENTURY

PIERRE LEROY-BEAULIEU



THE UNITED STATES IN THE TWENTIETH CENTURY

The United States in the Twentieth Century

By PIERRE LEROY-BEAULIEU

Authorized Translation by

H. ADDINGTON BRUCE

SECOND EDITION

FUNK & WAGNALLS COMPANY
NEW YORK AND LONDON
1907

[*Printed in the United States of America*]

Published, January, 1906

CONTENTS

PART FOUR

COMMERCIAL AMERICA

AUTHOR'S PREFACE TO THE AMERICAN EDITION.

It is always venturesome to present to the people of a country a book on that country written by a foreigner, and it is particularly so when the country in question is the United States, where political, economic and social conditions differ so greatly from those obtaining in Europe. I trust, however, that the reader who may be disposed to regard such a work as presumptuous will bear in mind that the present book is based on a study of American documents, that it is a book dealing with facts, and, as was said in the preface to the French edition, that it is primarily an inventory of the economic resources of the United States at the beginning of the twentieth century. All the facts and figures cited are taken from the "Report on the Twelfth Census" and from other authoritative official and private American publications, and thus possess strong guarantees of trustworthiness.

But it must be admitted that everything changes and grows so quickly in America that, brief as is the time which has elapsed since the book was written, some of the statistics presented do not exactly correspond to the state of affairs today. Nor is the author unaware that complete exactitude would in any event be out of the question. Had he imagined otherwise he would soon have learned his error while preparing this book, for the "Report" time and again draws attention to the inherent defects in the results of such an inquest and

constantly points out "limitations upon the use of census statistics." One cannot too highly praise the American statisticians for a prudent modesty which, so far as I am aware, they are the only statisticians to display. So far from diminishing their authority it increases it, for with such frankness their work is all the more deserving of confidence.

The author desires to be no less modest. He hopes that his presentation of the facts reviewed will in itself be sufficiently instructive to interest the reader. But with far less assurance he submits to the American people the inferences he has drawn from these facts and from personal observation; his analysis of the causes of the economic greatness of the United States, and the views he entertains concerning that country's future. Although assisted by the recollections of a visit paid to the United States a few years ago and of some months' duration, he has no doubt that his book contains more than one erroneous observation.

But he would ask the reader to remember that in many instances a foreigner's point of view is necessarily somewhat different from that of a native. At first glance it may perhaps seem that he dwells too long on certain points so well known that discussion of them would appear superfluous; but familiar though these be to Americans, they are by no means equally familiar to the inhabitants of the Old World — and it was for Old World readers that the work was originally written. On the other hand, the necessity of setting a definite limit to the treatment has resulted in the exclusion of much that it would have been interesting to examine.

In regard to certain of my comments and certain of the forecasts I have ventured to make, I would ask the reader not to form a hasty opinion but to leave to time the task of demonstrating their soundness or error. It is only fifteen months since this book was finished,

and already economic conditions have been noticeably modified in the United States, a period of depression having been followed by one of extreme activity in all directions. Now, in economic and statistical matters — as in many others — one is altogether too prone to allow his judgment to be swayed by transitory phenomena. It is not difficult to find recent illustrations of this tendency. For instance, the enormous development from 1897 to 1900 of the American export trade in manufactured goods, and particularly in iron and steel articles, created a panic among European manufacturers who saw therein the beginning of a veritable "American invasion." But when, from 1901 to 1903, they beheld a decrease in these same exports, they smiled at their fears. Now, however, another upward movement has set in, and Europe is quaking again. Similarly, after the poor cotton crops of the United States and the consequent rise in the price of that textile, almost everybody declared in 1903 and at the beginning of 1904 that America could no longer supply the world with cotton and that new cotton fields must be found. But the crop of 1904 proved enormous and, prices falling, it was the turn of the producers to become alarmed. There was even talk of burning a portion of the output. Since then prices have soared again and the consumers are once more betraying great anxiety. In respect to wheat, likewise, the assertion was freely made at the beginning of the present year that the American crop would be short and that the United States would disappear from the list of exporting countries — and, behold! an abundant crop exposes the rashness of such predictions.

I have striven to avoid similar mistakes — to free myself from the error of confounding transitory with permanent phenomena. My aim has been to discern the tendencies persisting beneath all the fluctuations due to "good times" and "hard times," to good crops and poor ones.

I do not flatter myself that I have been wholly successful. But I beg of my readers not to fall into a like error and hasten to condemn conclusions and forecasts which have not been immediately justified by the event. It may seem, for example, that I am unduly pessimistic in regard to the future of the "trusts." One of the most important of these — and doubtless several others — is at the present moment far more prosperous than it was when I wrote. I am none the less persuaded that I ought to adhere to my original opinion that the majority of these unwieldy organizations will be unable to survive an acute and prolonged period of depression. I believe, to put it briefly, that the attempt to monopolize a great industry and to control prices is certain to fail unless it receive direct or indirect governmental aid. And I am convinced that an unduly high opinion has been entertained of the dangers as well as of the strength of the trusts, and of the part they have played in the development of American manufacture.

What I would especially request my readers to believe is that in all I say of their country I am animated by a lively and profound friendliness. It is my conviction, moreover, that criticism fails of its mission if it be not made in a friendly spirit. Friendliness does not, or should not, exclude impartiality. But in order to perceive clearly and appraise correctly the affairs of a country, one must endeavor, so far as is possible, to put himself in the place, even, as we say in France, "de se mettre dans la peau," of the people of that country. And by doing so, but only by doing so, one may discover the moral factors underlying material conditions. The scope of my work has not allowed me to devote much space to an analysis of the former. But I have, nevertheless, tried to indicate them and to show their importance. The history of nations like the history of individuals proves beyond peradventure that no economic strength, no ma-

terial prosperity, is lasting unless it be sustained by real moral worth.

Moral worth, which includes the recognition of duties as well as of rights, self-respect and respect for one's fellows, has contributed fully as much as the magnificent resources of their country to the brilliant success of the American people. Of the qualities that have cooperated to elevate them so rapidly to such a commanding position, the most impressive is a great, a tireless energy. Now that the obstacles raised by nature have been overcome, now that the country is already so wealthy that the individual cannot always hope to see his efforts as richly compensated as was formerly the case; there is danger that this precious quality may be to some degree lost. It seems to me that the first care of the Americans should be to maintain it in all its integrity. Now, the essential condition to the development of energy is liberty. Every restriction on liberty, with however good a purpose, diminishes the sentiment of individual responsibility and initiative. Yet we often hear mooted in America as elsewhere measures which, under the pretext of correcting abuses, would immeasurably extend the state's sphere of action and reduce the liberty of the citizens. It is the author's earnest hope that the American democracy will reject such enervating proposals and will remain true to the virile and liberal traditions that have ensured the United States so wonderful a growth.

PIERRE LEROY-BEAULIEU.

Paris, September, 1905.

PREFACE TO THE FRENCH EDITION.

While I write the people of the United States are holding the St. Louis World's Fair to commemorate the one hundredth anniversary of the "Louisiana Purchase." They have reason for a splendid centennial celebration, because there has been no greater event in their history since the declaration of independence. Jefferson truly founded the Union a second time when he purchased from France that vast expanse stretching from the Mississippi to an ill-defined boundary line in the Rocky Mountains. The benefit derived by the United States from this acquisition is not to be measured merely by its area, nor by its material wealth. Only the least of the resultant gains are enumerated when it is said that the fourteen states carved out of ancient Louisiana comprise more than 1,000,000 square miles, are inhabited by 15,000,000 people, grow the greater part of the country's grain, raise one-half of its live-stock, and contain its richest gold, silver, iron, copper and zinc mines.

The real significance of the "Purchase"— that which makes it one of the salient facts of history — is that the United States was thereby relieved of all anxiety in respect to its frontiers and was saved from the burdens imposed upon countries with powerful neighbors. There is no denying that this has been a potent factor in attracting immigrants from Europe and in accelerating the national development. If Louisiana had remained in the possession of a European nation, or if it had passed — as was to be feared and as Bonaparte wished to prevent — from the keeping of France into the keeping of

England; if, in a word, the Union had not been extended beyond the Mississippi, how different the history of America and of the world would have been.

In addition to rendering the United States invulnerable and ensuring its predominance over North America, the acquisition of Louisiana gave it, at least indirectly, access to the Pacific. Being separated from the Great Ocean by only a relatively narrow strip of land it was inevitable that the Americans should occupy its shores. Moreover, the western and northwestern boundaries of the region ceded by France were but vaguely known, and if it was not certain that the "Purchase" included the Oregon country lying between the Rocky Mountains and the sea, it was unquestionably the possession of Louisiana that enabled the Americans to enter that country and hold it against the claim of England. Out of which has developed a chain of circumstances whose meaning we are only now perceiving. With the centenary celebration of the annexation of Louisiana its purely American consequences are barely completed, its universal consequences are but beginning to make themselves felt. Bordering on the Pacific, the United States aspires to the mastery of the Pacific. In 1898 the war with Spain gave it the Philippines. The same year it annexed the Hawaiian archipelago, negligible in point of area but invaluable by reason of location. In 1900 it acquired several of the Samoan Islands. The Panama canal, to be controlled as well as constructed by it, will greatly strengthen its position. Finally, the disorder prevalent in Eastern Asia for the past ten years, provides it with an excuse to develop its influence over the Asiatic seaboard, which it is much nearer than is Europe.

Side by side with this expansion movement, a striking phenomenon is manifesting itself in the economic life of the United States. It has long been the premier agricultural country of the world. It has now become

the premier manufacturing country. Not only does it continue to outdistance all competitors in the production of wheat, meat and cotton; but since 1890 it has wrested first place from England as an iron producing country, and, since 1899, as a coal producing country. Indeed, the day is not far distant when it will surpass England in the manufacture of cotton goods, just as, unfortunately, it is on the point of surpassing France in the manufacture of silks. And, greatly as its domestic consumption is increasing in consequence of the enormous increase in its population and its wealth; its industrial development has been even more rapid, so that now it is beginning to ship its surplus products to foreign markets. Today, manufactured goods form one-third of its export trade in place of one-twelfth twenty years ago. Not only this, but in 1901 its total export trade was for the first time of greater value than the export trade of any other country in the world.

England, doubtless, is the country which has most to fear from the economic strength now so impressively displayed by the United States. And in this we behold the fulfillment of the prophecy uttered by the First Consul when, according to Barbé-Marbois, he declared: "Appreciating the value of Louisiana I sought to remedy the mistake of the French commissioner who abandoned it in 1763, and I have recovered it by merely a few lines in a treaty. But scarcely is it returned to me when I am face to face with the prospect of losing it again. One day, however, it will cost those who are compelling me to renounce it much more than it is costing those to whom I am obliged to transfer it." But it must be admitted that if England has cause for alarm in the development of the United States, so also have the other nations of the Old World.

In these circumstances, it is apparent that the beginning of the twentieth century and the centenary of the

annexation of Louisiana mark a date of the first importance in the history not simply of the United States but of the world. And the colossal St. Louis Exposition, covering 1240 acres — an area four times that of our Exposition of 1900 — and costing $50,000,000 — or four times as much as was paid for the whole of Louisiana one hundred years ago; come opportunely to awaken us to the realization that a new era is dawning for the United States. It will be well, therefore, to make ourselves better acquainted with the resources and possibilities of that country; and it is in the hope of assisting to a clearer understanding that the present volume has been prepared.

In the main it is based on the statistics of the latest of those gigantic investigations which, under the name of "census," the Americans engage in every ten years. Much more comprehensive than our similar French inquests, the censuses are not merely concerned with the population; they undertake to analyze production in all its forms. Of the ten large quarto volumes, each containing a thousand pages, in which are condensed the results of the census of 1900, four deal with population, two with agriculture and four with manufacture. A supplementary volume on wages is issuing at the very moment I write these lines.

In some respects, however, the "Report on the Census" — the generic title given to these different volumes — fails to render a full account of the economic life of the Union. It contains nothing relative to the mineral industry, which has been made the subject of a special inquiry the findings of which have not as yet been published. Nor does it convey any information concerning the transportation facilities, the navigation and the commerce of the United States. In studying these several themes I have had recourse to sundry trust-

worthy official and private publications.[1] Moreover, I have not confined myself to the examination of statistical documents, for statistics alone seldom suffice to give an adequate idea of prevailing conditions. The reading of American magazines and newspapers, and the recollections of a sojourn of several months' duration in the United States, have been of great assistance to me in endeavoring to analyze and estimate the influence of the moral as well as the material factors in the progress and strength of the American people.

The material factors are the gifts of nature. In my opening pages I have attempted to give an outline of the distinctive characteristics of the territory of the United States; but I have not gone into this subject at all deeply, for my book is not intended as a geographical treatise. It is important for the reader to realize at the outset, however, that the United States as a region of colonization offers advantages to be found nowhere else in the world. It contains, to be sure, sterile sections unsuitable for agriculture or for settlement by a numerous white population. But if the "dry lands" of the West account for one-third of the 3,000,000 and more square miles of the United States, at least four-fifths of Australia and the same proportion of South Africa are far more barren than this arid zone; three-fourths of Canada is unfertile, or rendered so by cold; one-half of Argentina consists of steppes or semi-desert country; and, finally, fully two-thirds of the enormous Russian Empire is uncultivable, either by lack of heat or by lack of rain. More than this, in respect to mineral wealth, in respect to waterpower, and in respect to agricultural

[1] Particularly the "Statistical Abstract of the United States," an annual summary of the most important American statistics, and the "Monthly Summary of Commerce and Finance of the United States," published by the Treasury department; the annual report for 1903 of the Interstate Commerce Commission; and, among private publications, "The Mineral Industry," issued annually by the "Engineering and Mining Journal" of New York. I have also found much useful information in two New York weekly journals —"The Commercial and Financial Chronicle" and "Bradstreet's."

possibilities, all of the countries just mentioned are far less endowed than is the United States. While, if we turn to tropical countries we find tremendous obstacles to progress in the difficulty of acclimating white colonists. It would therefore seem that no new country can expect a development comparable with that of the United States. Strongly entrenched between its two oceans, and having nothing to fear from its neighbors, it is in a unique position which all may envy but which none can reach.

The wealth and strength of a country depend, of course, on its population as well as on its natural resources; and the value of the human element, again, lies not so much in the number as in the quality of its inhabitants. In both respects the United States has been exceptionally favored. Small in numbers at the beginning of the nineteenth century its population has increased more rapidly than that of any other Power; so rapidly, indeed, that by 1870 the United States had more inhabitants than any European country with the exception of Russia. And, it may be said in passing, it seems hardly likely that its population will ever outnumber that of the Empire of the Czars, for the latter increases equally as rapidly thanks to its remarkable fecundity. On the other hand, the United States today has twice as many inhabitants as France or England, and one and one-third as many as Germany. But it is in respect to the quality of its people that its superiority is most pronounced.

From the days of the Pilgrim fathers, who expatriated themselves in order that they might establish on the rude shores of Massachusetts a government resting on the principles they derived from the Bible — from their days to the days of the modern immigrants, twenty millions of whom have settled in the United States during the past seventy-five years; the Americans have

been the product of a selection and of a double selection. Only the boldest, the most enterprising of men have the courage to traverse the sea for the purpose of carving out a new life in an unknown and distant land. Then, having arrived, only the most energetic, the wisest and the most gifted in the spirit of organization succeed in a struggle which is more severe, more merciless to the feeble, in new countries than in old ones. Thus America, so to speak, has secured the cream of Old World society. That is why the human standard is higher there than in other countries.

If the Americans are energetic and active, and if their activity at times goes to the point of restlessness, they are likewise a people of great self-control. There can be no question that they are still largely imbued with the spirit of the early Puritan colonists. Heavy as the immigration movement has been at certain periods it has never submerged — as happened in Australia — the native element, which has been able to inspire the newcomers with its traditions and with its ideals. And this it has all the more easily done because the immigrants have chiefly been of the same nationalities as the original settlers, or of readily assimilable strains. My analysis of the census and immigration statistics convinces me, moreover, that the greater number of the present white inhabitants of the United States are the descendants of those who were in that country at the beginning of the nineteenth century, and who came thither from the British Isles — which does not necessarily mean that they were "Anglo-Saxons." In any event, the work of colonizing the West has been mainly carried on not by immigrants but by native Americans and by the wholly Americanized sons and grandsons of immigrants. Such, further, are immensely in the majority in the rural districts and in the towns, and form, in a word, the solid substratum of the American population.

But is not this race-type — which, whatever its faults, is assuredly remarkable — liable to decline in the future, and will not the twentieth century witness its degeneration? These questions are raised by many who fear the influence of the recent flood of immigration from Southern and Eastern Europe. To-day most of the immigrants are from "backward" countries, are people largely out of touch with modern civilization and far more difficult to assimilate than the Germans and Scandinavians who, up to about 1890, with the English and the Irish greatly outnumbered all other immigrants. Less enterprising, less self-reliant, and utterly at sea in an environment differing radically from that to which they have been accustomed, the late-comers have huddled together in the cities, where they are accused of lowering the rate of wages and of in no wise contributing to the real development of the country.

It may be, however, that the Americans take too pessimistic a view of the consequences of the change in the origin of the stream of immigration. Among the new arrivals there are some — the Italians, for instance — who are by no means devoid of good qualities however defective they may be in certain respects. Besides which, the population of the United States is now so numerous that immigration cannot modify it to the extent once possible. But it is not to be denied that the introduction of these new and heterogeneous elements may in some degree affect native characteristics. And should it exercise any marked influence on the American race-type, that influence can hardly be other than harmful. Wherefore it is easy to understand why the government and the citizens of the United States regard the immigration question as a pressing problem.

Of greater moment, however, is the problem raised by the presence of nine millions of negroes. Truly, the Americans are being punished for the crime of slavery

by being compelled to drag, like a ball and chain, the dead weight of an inferior people, and of a people that will remain inferior if not forever certainly for centuries. The negroes have a higher birth-rate than the whites and, altho their ignorance and unhygienic modes of living cost them a higher death-rate also, they would doubtless increase far more rapidly than the whites were not the latter reinforced by immigration. Since immigration is destined to diminish absolutely as well as relatively with the passage of time, one may say, almost with certitude, that the proportion of negroes to the whole population is unlikely to fall, at the lowest, below the present rate of 11 or 12 per cent. What is possibly more serious is that the colored population is showing an ever greater tendency to isolate itself in a "black belt" where, removed from the civilizing influence of the whites, it can only sink to barbarism.

Even when the two races might naturally be expected to come into contact in the course of everyday life, an intense race prejudice operates to keep them almost completely apart. In railway or street car, in factory, school or church, separate provision is made for the negroes. And this is carried to such an extreme that in the majority of Protestant denominations we find a dual organization. There are, for example, an African Methodist Church and an African Baptist Church distinct from the Methodist Church and the Baptist Church proper. Many of the ministers of these colored churches are ignorant, some of them are vicious. "What are the chief faults of the colored clergy?" was demanded in a recent inquiry, and some of the witnesses replied: "Whiskey and women."[1] Tho we must be careful not to generalize too freely from such an accusation, it is unquestionable that the institutions which should elevate the negro — the school and the church — are so

[1] "The Negro Church," by W. E. Du Bois.

neglected that they fail to perform their mission. At the present time the "race problem," which has become complicated with political issues, is more acute than ever. To tell the truth, it would seem to be insoluble. And if only for the reason that they keep white colonists out of one of the finest sections of the country, the negroes must be regarded as handicapping the future of the United States.

Blessed with a favorable environment, and themselves endowed with the finest qualities, the American people have made the most of their advantages. The greater part of this book will be devoted to showing how this energetic nation has developed the resources so generously bestowed upon it by nature. The examination of American methods is always interesting and instructive, albeit it must be recognized that they are not wholly applicable in our old Europe. Some, indeed, must undergo — and perhaps before long — modifications in America itself. This is particularly the case in respect to agriculture. Up to the present it has been possible to conduct it along extremely extensive lines, thanks to the quantity of new land available.

But there now remains very little virgin soil of the first order or of good location. The greater part of the still unoccupied territory is insufficiently irrigated, poorly provided with transportation facilities — and railways cannot be multiplied indefinitely — or of a low grade of soil. Moreover, some sections that have been under cultivation for a long time, have not been properly treated and are showing signs of exhaustion. Altogether, it would seem that American agriculturists, who are so advanced in some ways — notably in the employment of machinery — but so backward in others — especially in the use of fertilizers; will soon be under the necessity of altering their methods. But there is no reason for

believing that they will be unable to adapt themselves to the changed conditions.

The American rural democracy — this great agricultural country is a country of small holdings — is so energetic, progressive and business-like, and is so ready to avail itself of the discoveries of science, that it will undoubtedly continue to increase its production. But it is noteworthy that for some years the increase — in food and industrial growths alike — has not been more rapid than the increase in the population and, consequently, that the surplus available for exportation remains stationary. Everything indicates that this will continue to be the case. Whence it follows that it is from the very new countries, such as Canada and the Argentine Republic, rather than from the United States that the competition of the future will come. And very likely, these countries not being so richly endowed as the United States, our agriculturists will find it less difficult to hold their markets.

What is today attracting the attention of the outside world to the United States, and what will attract its attention more in the future, is the growth of that country as a manufacturing nation. It is in manufacturing that the Americans are now most actively engaged and are obtaining really marvellous results. The question at once arises — why are they so successful in this field? They themselves recognize the operation of five great factors: their agricultural resources; their mineral resources; the development of transportation facilities; freedom of inter-state commerce; and emancipation from ultra-conservative ideas and from ideas inherited from the past. Such is the reply given in the "Report," the authors of which refuse to be biased by national allegiance and willingly recognize the part played by nature in the economic growth of the Union.

The view thus expressed, is in my opinion, far more

correct than that entertained by many Europeans who would attribute the manufacturing development of the New World to such temporary and secondary phenomena as the "trusts" and the tariff. Whatever may be thought theoretically of protection and free trade, it is unwise to cite the United States as an example of the great benefits to be derived from the former policy. The Americans themselves, as I have just said, admit that freedom of exchange between their several states rather than the tariff wall they have erected against the outside world, is the secret of their industrial progress. As a matter of fact protection does not mean to the great republic of the New World what it means to the relatively small countries of the Old. On the one hand, there is in the United States an enormous domestic demand due to the immense population which increases so rapidly and consumes so much; on the other, this demand can be met almost entirely by domestic production, so varied is the climate and so diverse are the resources of the country's vast territory. And, in accordance with the economic law that the cost of production is reduced in proportion to the growth of the market and the length to which the principle of division of labor is carried, production is very cheap in the United States. Obviously, a quite different situation obtains in the majority of European countries with their smaller and less favored territory and with their lighter and less rapidly increasing consumption.

As to the trusts, so far from deeming them essential to industrial growth I look upon them as merely incidental and transitory consequences of growth. Even now, while Europe is shivering before them, they are beginning to show in the land of their birth signs of their inherent weakness. Some, to be sure, may survive by reason of being exceptionally favored by natural or artificial conditions; or (tho the difficulty of exercising

adequate control over vast undertakings, often ends in disaster) by pressing to the furthest limit possible the principles of division of labor and concentration of management — the distinctive characteristics of modern industry. But the great majority, created by visionaries who have been carried away by a period of exceptional prosperity, totter and fall so soon as business begins to slacken. This is what happened to the pioneer trusts ten or twelve years ago, and history is repeating itself at this very moment. Decidedly, the prodigious development of American industry is not due to the trusts; it is not they who have rendered it so menacing to the industry of the Old World.

The true causes of the progress of the United States are those mentioned in the "Report" and may be summed up in the statement that the natural resources of the country are immense and its inhabitants the most energetic of people, their innate energy increasing under the influence of the environment of a new land where everything grows quickly and where labor and intelligent enterprise can rapidly earn a far greater recompense than would be possible in Europe. Making a closer inquiry, one is particularly impressed by the ease and rapidity with which American manufacture adjusts itself to new conditions; by the way in which commerce and transportation are organized; by the absence, among the working-class, of the routine spirit and of prejudices against the employment of machinery; by the boldness of the capitalists, and by the enterprise of the captains of industry and the higher employees, who are always on the lookout for technical improvements and for capable assistants.

There can be no doubt that the manufacturers of the United States will soon be competing with the manufacturers of Europe more vigorously than ever. During the past few years an exceptional prosperity has so aug-

mented the domestic demand that the exportation of American made goods has increased less rapidly than was expected in 1899 and 1900. But the "good times" are passing, and the "American invasion" begins anew. We shall witness, during the first quarter of the twentieth century, a movement in the industrial sphere similar to that which occurred in the sphere of agriculture during the last quarter of the nineteenth century. American-made goods will compete in Europe as well as in the new countries with the products of Old World manufacture.

Herein lies one of the reasons why the Americans are extending their political influence oversea. Together with the instinctive need for expansion felt by all young and vigorous nations as by all young and vigorous men they desire to make sure of new markets in case European countries close their gates, whence, in large measure, the colonial acquisitions of the United States and the interest it is displaying in the affairs of the Far East. A detailed study of American imperialism is not within the scope of this work, but a few words concerning it are necessary. It is the outgrowth, on the one hand, of the historical evolution which, beginning with the annexation of Louisiana, has made the United States the most powerful nation on the shores of the Pacific; on the other hand of the remarkable development of American manufacture. To put it otherwise, the economic competition of the New World has given rise to political competition. The United States is formidably equipped for both. When it desires, it can have one of the strongest navies in the world, and it will doubtless so desire as soon as the Panama canal is completed. Invulnerable at home, it can, without keeping up a large army, easily secure troops for foreign service in the Far East or elsewhere, of a strength at least equal to that of the expeditionary forces of any other Power.

Undoubtedly, the Americans will encounter more than

one obstacle in the new road they have elected to travel. Incongruous elements will be introduced into the Union by the admission of Porto Rico and (as is quite possible) of Cuba and other islands of the Antilles. The federal and democratic constitution of the people of the United States, their governmental system and their vicious method of filling public offices, are ill adapted to the government of countries like the Philippines inhabited by races of an altogether different order. But if the Americans still have some lessons to learn in the governing of men, we may be sure they will learn them quickly. And they have long been past masters in the art of opening up new countries. With the advance of colonization their hardy pioneers are beginning to find less and less vent for their energy in the United States itself, and will inevitably look for the new opportunities abroad, turning to tropical countries whence Europe may expect a new and redoubtable competition once American capital and labor develop them.

The first century following the annexation of Louisiana witnessed the United States obtain a preponderating influence over North America. The centenary of that great event finds the United States expanding beyond the confines of America. Before the second century be far advanced, the United States will unquestionably dominate economically all the Asiatic and American countries bordering on the Pacific, and will be playing in the world the part played until these latter days by England. This is its destiny, a destiny resting in large part, to be sure, on the magnificent gifts bestowed by nature; but resting too on moral foundations. If the United States is the richest country of the world in coal, in iron, in copper, it is also the richest in human energy. It is pre-eminently, as has been well said by one of the most truly representative of Americans, President Roosevelt, the land of the strenuous life.

PIERRE LEROY-BEAULIEU.

Paris, May, 1904.

PART ONE

THE COUNTRY AND THE PEOPLE

CHAPTER I

ENVIRONMENT

The power and wealth of a country are the product of the joint efforts of nature and man. Only through a combination of the gifts of the one with the intelligence and energy of the other can a nation be brought to a high degree of strength and prosperity. Nature provides the raw materials; she also provides, though in an undisciplined condition, forces — wind, water, steam and electricity — that may be utilized to develop these materials. Man's part it is to put these forces into motion, to transform these materials into wealth by means of his labor and his capital — that is to say, by the supplies, equipment and instruments he possesses and which have become his as the result of previous labor.

Now it occasionally happens that very energetic and very capable men achieve much more in countries deficient in natural resources than is attained in countries far better endowed, but whose inhabitants are indolent, dull, or lacking in capital. Still, however true it may be that countries highly favored by nature frequently remain poor and undeveloped, through man's fault, it is none the less true that countries upon which nature has frowned can never, no matter how worthy their inhabitants, acquire other than a mediocre development. It is equally certain that where the greatest riches of nature and the highest qualities of man are united a magnificent development may be expected. In order to understand and view in correct perspective the development of the United States, it is, therefore, necessary to take a brief

survey of natural conditions — of the environment in which the people live, move and have their being — before turning our attention to the people themselves.

The entire middle portion of North America, from ocean to ocean, is occupied by the United States. Its southern extremities in Texas and Florida almost touch the tropics, descending, indeed, to the latitude of Upper Egypt, of the central valley of the Ganges, and of Formosa, and being much nearer the equator than is any point on the European continent — which does not extend below the thirty-sixth parallel. In the north, the United States is separated from Canada by the forty-ninth parallel, which serves to mark the boundary line between the two countries. This is the latitude of Paris, but owing to the fact that the great plains of the northern section of North America are withdrawn from the mellowing influences of the sea and of the Gulf Stream, there is to be found north of the frontier only a narrow belt suitable for cultivation and colonization. The United States, then, holds the temperate portion of the continent, and its 3,035,600 square miles are worth much more than is the slightly larger territory of Canada.

The geographical structure of the United States may be sufficiently indicated in a few words. Parallel to both the Atlantic and Pacific oceans run mountain chains. In the north, the mountains on the Atlantic side — the Appalachian or Alleghany — approach quite near the ocean, from which they are separated by stretches of rocky, well-nigh sterile country. They pass south to below the forty-first parallel, having between their base and the littoral a plain of from two hundred to two hundred and fifty miles in breadth, divided into terraces the lowest of which, swampy in many places, is covered with immense pine forests extending to within a short distance of the shore. Cut, as a rule, into several parallel chains, the Appalachians are not very high. Indeed, they have

but one summit that surpasses — and that by very little — 6,000 feet. Thus they do not offer any very serious obstacles to communication between the coast and the interior. The central part in particular, which is the least elevated, affords to and from New York, Philadelphia, Baltimore, etc., numerous and easy passages through the valleys of the Hudson, the Susquehanna, the Potomac and their tributaries. In the south the last ridges of the Appalachians come to an end about two hundred and fifty miles from the Gulf of Mexico. At every point one can easily cross or turn these well-wooded mountains.

The Rocky Mountains are of a very different character. Broken only by San Francisco Bay, a first chain rises quite near the Pacific coast. This is the Coastal Range, whose chief summits attain an elevation of about 6,000 feet. Behind the expansive valleys of the San Joaquin in the south, of the Sacramento in the centre and of the Willamette in the north — valleys which might almost be called plains — rise the formidable shapes of a second chain, known in the south as the Sierra Nevada and in the north as the Cascade Mountains. This range boasts summits of more than 12,000 feet and presents only two openings — one in the north, through which the Columbia River passes, the other in the extreme south where the Colorado finds outlet. It forms the western boundary of an immense plateau, from seven hundred and fifty to eight hundred miles wide in its central part, and delimited on the east by the impressive Rockies. The latter form a less continuous barrier than the Sierra Nevadas and the Cascades, but have peaks frequently surpassing 9,000 and sometimes, in the centre and the south, 12,000 feet in height. The great plateau itself, cut up by secondary chains whose depressions are occupied by salt-impregnated soil and lakes, has an altitude of from 3,600 to 6,000 feet. It narrows

towards the south, being separated from the Gulf of California by deserts. In the north it almost disappears, to be replaced by plain-like valleys along the Columbia and its tributary the Snake, and by a chaos of mountains running on into British Columbia. Thus, from the Mexican to the Canadian border a powerful mountain barrier rises between the Pacific coast and the great central plains.

These plains extend for from eleven hundred to twelve hundred and fifty miles, east and west, between the Rockies and the Appalachians, and for a similar distance north and south between the Gulf of Mexico and the Canadian frontier. They slope imperceptibly towards the low and lagoon bordered Gulf coast. In the north-east the granitic and wooded regions bordering on the Great Lakes and containing the source of the Mississippi, make hardly any impression on them, save where a few feeble ranges of hills attain an altitude of 1,200 feet, or about 600 feet higher than the surrounding country; in the north-west the plains continue beyond the limits of the Union, continue, indeed, up to the northern boundary of the continent itself. There is no noticeable dividing ridge between the waters that flow into the Gulf of Mexico by the Mississippi, those which flow into the Atlantic by the Great Lakes and the St. Lawrence, and those which direct themselves towards Hudson Bay and the Arctic ocean by the Red and the Assiniboine rivers and the lakes of Manitoba. The Desplaines river, a subtributary of the Mississippi, flows within less than six miles of Lake Michigan, and in seasons of flood the waters of the lake mingle with those of the river. From the Mississippi basin the plains rise slowly toward their eastern and western borders — to the east by gentle undulations, to the west more abruptly, sudden elevations being sometimes seen in the prairies. Unwooded, their horizons are limitless; but their soil is fertile, and only requires the removal of insignificant brushwood to be

ready for cultivation. This is the happy land of colonization.

Other things being equal the climate of the United States, on account of the latitude, should be much warmer than ours. In fact, it is so during the summer. Save in the extreme north-east and the extreme north-west, at the two ends of the Canadian frontier, save, also, on extremely high Rocky Mountain plateaus, the average temperature of July exceeds 20 degrees centigrade when it hardly reaches 19 degrees in Paris. The temperature of New York and Chicago is much the same as that of Marseilles, which is not at all surprising since both cities are in a more southerly latitude than our great Mediterranean port. For more than a third of the country — for a vast zone which, on the Atlantic side and in the basin of the Mississippi, stretches as far as the fortieth parallel, from Baltimore to St. Louis — the average for the warmest month of the year exceeds 25 degrees, an average unknown in France; while at New Orleans and on the littoral of the Gulf of Mexico it reaches 30 degrees. Summer, then, is exceedingly warm in the greater part of the United States.

On the other hand, winter in almost every part of the Union is exceedingly cold. For example: on the Atlantic coast, which is not warmed as is Europe by the waters of the Gulf Stream, New York, in the same latitude as Naples, has colder winters than Berlin; while the winters of Boston remind one of the Stockholm winters. In the central region, in the vast plain of the Mississippi, which is open to all the winds of the north and from which the Alleghanies, and still more, the Rockies, exclude the tempering influence of the breath of the ocean, it is much worse. At St. Paul and Minneapolis, below the forty-fifth parallel, the latitude of Bordeaux, the average temperature for January is as low as 12 degrees below zero, while it is 2 degrees above at Paris; at St. Louis, below

the thirty-eighth parallel, and in the latitude of Palermo, it is also noticeably below zero.

Speaking generally, the winter temperature falls rapidly not only when one passes from the south towards the north, but also when one advances from east to west, up to the vicinity of the Rocky Mountains. About the Gulf of Mexico, in Florida, Georgia and the Carolinas, the winters are, of course, very moderate. The average for January at New Orleans is about 10 degrees, an average holding good for the entire year at Paris. But even these regions of the extreme south, with the exception of the most southerly parts of Florida and Texas, are liable to " cold waves," which, after having given rise to frightful blizzards in the Mississippi basin, pass south to cause short but disastrous frosts. I have seen oranges frozen at Jacksonville, Florida, below the thirtieth parallel, the like of which is unheard of at Nice in the forty-third. The Pacific coast, bathed by warm currents of water, is the only part of the Union not liable to severe winters. Oddly enough, the summers are also less scorching there, being mild even as far south as the California littoral. In the north a large part of Washington and Oregon, bordering on Canada, has a climate quite comparable to that of the Isle of France; but these favored regions are of relatively small extent. The tablelands of the Rockies behind them have torrid summers and very cold winters, the rigor of which, however, is less extreme despite the altitude than is that of the winters of the central plains.

Altogether, the distinctive traits of the climate of the United States may be expressed well enough, by saying, with certain Americans, that it is " tropical-arctic " — tropical in summer, arctic in winter. Spring hardly exists; autumn, on the contrary, is very fine, being gentle and agreeable. In the distribution of the rainfall the same tendency to extremes is noticeable up to a certain point. Almost everywhere the division is less equable

than in western Europe, rain falling with more violence but on a smaller number of days in the year. East of the Mississippi and in large sections of the states bordering that stream on its western side, the rainfall amounts on the average to more than 36 inches a year, or almost double the rainfall of Paris. However, the sky is as a rule clearer than in our country and there is a greater tendency to untoward drouths, especially in the northern half of the region; conditions in the southern half are almost tropical — an annual rainfall of nearly 72 inches, with humid and depressing heat in the summer.

Crossing the Mississippi the amount of the annual rainfall rapidly diminishes. From three hundred and seventy-five to five hundred miles west of the river, following a line almost identical with the hundredth parallel of longitude, it becomes less than 20 inches a year. The irregularity of the rainfall and the consequent long drouths effectually prevent the cultivation of the soil, except in some privileged sections and in valleys susceptible of irrigation. This is the so-called " dry lands " region, which embraces the tablelands of the Rockies and the western portion of the plains, for a length of twelve hundred and fifty miles, north and south, and a breadth of seven hundred and fifty to eight hundred miles, east and west. This represents about a third of the territory of the United States — or a surface five times that of France. Almost half of the region in question is quite arid, and is made up of deserts that extend over the tablelands of Utah, Nevada and Arizona, the south-east of California, a large portion of New Mexico and parts of neighboring states. Finally, after having crossed the Sierra Nevadas and the Cascades one encounters a zone sufficiently watered for agricultural purposes, but only about one hundred and twenty-five miles broad and very hilly.

With its immense central plains and its enormous western mountain masses, with its extreme climate and

its entire nature violent, the territory of the United States was obviously ill adapted to the development of an autochthonous civilization. Primitive peoples naturally make easiest headway in countries separated by chains of mountains and by arms of the sea into compact divisions, where the inhabitants, protected from their neighbors, can organize and develop in peace. Gentle climes, too, are needed, climes wherein the natural plagues of flood and drouth and extremes of heat and cold do not assail primitive man with the discouraging violence they possess in the New World or in the tropical zone. On the other hand, for a civilization imported from without by men who have already learned how to avoid the excesses of climate and how to yoke the forces of an exuberant nature; above all, for the civilization of today, what a marvellous country is that of the United States! Its immense and level plains lend themselves admirably to cultivation on a large scale and to the economical establishment of railroads, conjoining with a superb network of navigable waterways to expedite the transportation of the products of the soil and of the sub-soil. Products of a semi-tropical character, as well as the products of the temperate zone may here be cultivated. Here, too, and in immense quantities, is the mineral wealth so essential to present-day civilization — here, iron and coal, the muscles and blood of modern industry, are found not only in abundance but under the best conditions for development. The industrial prosperity that has been so materially forwarded by the presence of vast beds of fuel promises, moreover, not to lack a tomorrow, for waterpower, whose supremacy is announced for a near future, exists in great quantities. Of all countries offering themselves to the colonization of old Europe the United States is assuredly the most richly endowed by nature.

CHAPTER II

ORIGINS AND CHARACTERISTICS OF THE AMERICAN PEOPLE

The vast territory whose principal features have just been described, was almost unoccupied at the time of the advent of Europeans. It was inhabited only by nomadic tribes of Indians, who in the main were a feeble people. In the south-west alone, in New Mexico, the Pueblos had formed a community that was well advanced beyond the primitive stage, understood agriculture and even practised irrigation. But nowhere existed a true civilization such as had been found on the high tablelands of Mexico and Peru. Thus the natives — who even today, in a pure or hybrid state, still form a great majority of the population of Central America and the Andean region of South America — have played an insignificant role in the United States. Driven little by little toward the dry lands, seeing their spheres of influence reduced without cessation, unable to pass with sufficient rapidity from the state of a hunting to that of an agricultural people, falling easy victims to all the ills the whites might bring them, victims, too, of wars followed often by merciless acts of repression, which sometimes included the transplantation of entire tribes; they have seen their number decrease until today they do not make a total of much more than 300,000 souls. Doubtless in the early days of colonization frequent unions took place between European men and Indian women — the story of Pocahontas brings to mind the legend of the Gaul Gyptis and the Greek Euxena, founder of Marseilles — and it is certain that there is a large number of Americans in whose

veins flow some drops of Indian blood. But the proportion of alloy is really infinitesimal, and under the influence of immigration tends to become more and more reduced. So that we have a perfect right to neglect the native as an ethnical factor in this territory which once was his but which he never knew how to develop. The population of the United States has come from abroad, and has from the beginning sprung from quite varied elements.

The first foreigners to establish themselves on continental America were Spaniards, who arrived in the middle of the sixteenth century. The old fort of St. Augustine, built by them in Florida, passes for the most ancient American edifice of European construction, but perhaps the buildings put up at Santa Fe in New Mexico are still older. In any event, none of these establishments ever acquired importance. A little later, during the last quarter of the sixteenth century and the first years of the seventeenth, English colonies were founded on the Atlantic coast — notably in Virginia and New England. An important primary current of emigration from the mother country to the New World was determined by religious persecutions and by an economic crisis provoked by the substitution of grazing for husbandry in England. The British Crown was wise enough to encourage the peaceful establishment of dissenting religious groups in its over-sea possessions in place of transporting there the spirit of persecution which was raging in the metropolis. Therefore the growth of population was rapid, and by the middle of the seventeenth century the inhabitants of English origin were in a great majority. Their preponderance, however, should not make us forget that at the beginning of the seventeenth century there were established in New Jersey and Delaware a little Swedish colony, and in New York, then New Amsterdam, a Dutch colony whose importance is attested by the great number of Dutch family names still found in New York — while

the Dutch have given to the United States two presidents — Van Buren and Roosevelt — as well as one of the richest families — the Vanderbilts.

About the time of the English settlement, the French attempted to establish themselves on the Atlantic coast, where the master mind of Coligny had dreamed that the foundations of a Protestant colony might be laid. For this purpose the Carolinas were visited. Had the French shown themselves as intelligent as the English they would have favored an over-sea establishment of religious dissenters and would have given our race an opportunity to dispute more successfully with the English the empire of North America. But all too few of us have ever understood that intolerance should at least not be made an article of exportation. After the revocation of the Edict of Nantes a number of French Huguenots fled to America, where traces of them may yet be found. In Boston, for instance, I was shown a large building, "Faneuil Hall," or "the cradle of liberty," which bears the name of one of those French refugees. Other Frenchmen settled in the United States after the War for Independence, and still others during the French Revolution and the Empire. Thus it was that during my travels through the Union I met a descendant of the economist, Dupont de Nemours.

The strongest French contingent in America is found in Louisiana which, at the time of its cession in 1803, had 20,000 inhabitants. One hundred years ago, however, the German element in America had become more important than the French, numerous Hanoverian subjects of the kings of England and other Germans having emigrated to the United States during the eighteenth century, settling for the most part in New York and Pennsylvania.

At the beginning of the nineteenth century, that is to say at the beginning of its existence as a nation, the

population of the United States was, therefore, far from purely English; but if the British blood had been pretty strongly diluted, there can be no doubt that it predominated, and predominated heavily in the four millions of white inhabitants that the Union counted in 1800. In addition to these whites was present an exceedingly heterogeneous element — a million blacks brought from Africa to work as slaves on plantations in the Southern states. The presence of this inferior race, difficult to assimilate and hampering the progress of one of the finest sections of the Union, is even today raising the most difficult political and social questions — and a sad punishment for slavery is witnessed. Happily for Americans, as for the self-respect of civilization, the importation of slaves did not continue beyond the first years of the nineteenth century, so that the proportion of blacks to the total of the population has sensibly decreased. On the other hand, during the past century, and especially since 1840, there has come from all parts of Europe, even from all parts of the world, an enormous influx of immigrants to modify profoundly the composition and character of the American people.

It is possible for us to take account of the changes that have thus been brought about, thanks to the decennial censuses and to the fact that immigration statistics have been regularly kept for the past eighty years. Let us first survey the growth of population, and particularly the growth of the two great elements, white and colored, and then ascertain the total immigration since the first census was taken in 1790. The following table gives the requisite statistics:

GROWTH OF THE POPULATION OF THE UNITED STATES FROM 1790 TO 1900.

	White.	Colored.	Total.	Immigration during the preceding decade.
1790	3,172,006	757,208	3,929,214	
1800	4,306,446	1,002,037	5,308,483	About
1810	5,862,083	1,377,808	7,239,891	200,000
1820	7,862,166	1,771,656	9,633,822	
1830	10,537,378	2,328,642	12,866,020	143,439
1840	14,195,805	2,873,648	17,069,453	599,125
1850	19,553,068	3,638,808	23,191,876	1,713,251
1860	27,001,491	4,441,830	31,443,321	2,598,214
1870	33,678,362	4,880,009	38,558,371	2,314,824
1880	43,574,990	6,580,793	50,155,783	2,812,191
1890	55,166,184	7,903,572	63,069,756	5,246,613
1900	66,990,788	9,312,599	76,303,387	3,844,359

The increase in population has therefore been very rapid. Up to 1860 it constantly exceeded 30 per cent per decade, reaching 36 per cent from 1840 to 1850 and from 1850 to 1860. It fell to 23 per cent during the period 1860–1870 by reason of the disastrous Civil War which caused the death of half a million men, diminishing the movement at once of the birth-rate and of immigration. It rose again to 30 per cent from 1870 to 1880; finally, to become 25 per cent during the following decade and 21 per cent during the last. There is nothing surprising in the statistics of the past twenty years, for, even if immigration should be maintained at a constant level with the natural increase in the population, it would represent only a dwindling proportion of the increase in population.

Rapid as has been this increase in population, it has been relatively much less than the increase in certain other new countries. Take Australia, for example, where the population tripled from 1831 to 1841, doubled from 1841 to 1851, tripled again from 1851 to 1861, as a result of the discovery of gold mines, and still showed an increase by half from 1861 to 1871. In the United States the proportion of immigration to population per decade has never been more than 8 per cent (a figure attained in

1860 and in 1890) while in Australia it was almost 50 per cent in 1861 and until 1891 did not fail to exceed 10 per cent. Again, it should be noted that the American immigration statistics are to a certain extent crude, since nothing is subtracted for departures, whereas in Australia such deductions are made. It seems to me that a great part of the incontestable superiority of America over Australia has resulted from the slower movement of emigration to the United States. American society has had much more time to digest and assimilate the elements received from abroad. In addition to this, it should be noted that emigration to the United States did not set in in earnest until about 1830, by which time there was already a solid substratum of ten millions of whites, with institutions and traditions of their own and with the ability to impregnate the newcomers with a spirit of sturdy self-respect. The newcomers, it should be added, were generally of a quality superior to the avalanche of mere fortune hunters which about 1850 submerged the youthful Australia society, too feeble to react upon it successfully.[1] As opposed to this, the essential traits of the American people were developed by 1830 and although somewhat modified, survive today.

Nevertheless, it must be said that the blood of the American people has undergone considerable admixture. In order to allow the reader to take account of this for himself, I give herewith, according to the official statistics from Washington, the number of immigrants who have come into the United States from the leading foreign countries. Four groups are to be distinguished: immigrants from the north and north-west of Europe, to which immigrants from Canada are added. Such immigrants the Americans consider "desirable," because they

[1] For a detailed study of the differences in the growth of the population of Australia and the United States, and the social consequences resultant therefrom, see M. Leroy-Beaulieu's earlier work, "Les Nouvelles Sociétés Anglo-Saxonnes," p. 57, *et seq.*

are readily assimilated. Next come the immigrants from the south of Europe, hailing from countries more backward and more difficult to assimilate. Next are the Asiatics, and principally the Chinese, who are the least assimilable of all; and, finally, immigrants from countries where the emigration movement is very feeble. The decade 1820–1830, in which immigration scarcely made itself felt, is left out of account.

The table also gives an idea of the great changes that have occurred, not only in the volume but in the quality and character of the immigration. At first the Irishman was especially numerous. Then, from 1850 to 1890, the German immigrant was most in evidence. From 1880 to 1890 the Scandinavian made his appearance in large numbers, and has continued to swell the immigration statistics. There has been a steady stream from England and Scotland, a stream, however, that has diminished during the last decade.

IMMIGRATION INTO THE UNITED STATES FROM 1830 TO 1900 (BY THE THOUSAND).

Country of departure	1830–50	1850–60	1860–70	1870–80	1880–90	1890–1900
Canada[1]	55	59	154	383	392	?
Germany	587	952	787	718	1,453	544
Great Britain	342	424	607	548	807	342
Ireland	988	914	441	437	655	403
Norway, Sweden and Denmark	17	25	126	243	656	379
Total	1,989	2,374	2,115	2,329	3,963	1,668
Austria-Hungary	...	...	8	73	354	597
Italy	4	9	12	56	307	656
Russia and Poland	1	2	5	52	265	586
Total	5	11	25	181	926	1,842
Other Countries	318	172	95	178	290	247
Asia	...	41	65	124	68	87

[1] Since 1885 no statistics have been kept of the number of immigrants arriving by land from Canada and Mexico, it being found impossible to obtain exact figures.

We see, therefore, that immigrants from countries of the north, that is to say the most assimilable immigrants, dominated the immigration movement up to 1880 and were also in a majority from 1880 to 1890. Since 1890, and more particularly since 1895, an enormous access of immigration from the south and east of Europe has tended, on the contrary, to introduce elements much more heterogeneous, more difficult of assimilation, of a lower grade and less educated — in a word, more backward from every point of view. Numbers of these newcomers have found it difficult to sustain the struggle for existence in a country where the struggle is indeed severe. So the Americans have frowned upon them and multiplied laws restricting immigration. Nevertheless, the conjuncture of a period of prosperity in the United States with a period of depression in Europe has recently had the effect of making the volume of immigration larger than ever during the past few years, while the peoples from the east and south of Europe have constantly contributed more and more heavily to the total. Thus we find that, in 1903, the immigration from Italy, Russia and Austro-Hungary aggregated 572,000 people, while only 186,000 came from the United Kingdom, Germany and the Scandinavian countries. Taking into account the secondary countries, Roumania, Greece, Spain, Portugal, etc., we find that out of more than 814,000 immigrants arriving from Europe, 609,000 came from the east and the south and only 205,000 from the north and the west.

Conditions today, therefore, are exactly the reverse of the conditions prevailing during the decade 1880–1890. Assuredly, here is something deserving consideration. However, the new elements that have been introduced within the past few years have not yet had time to exercise a noticeable influence on the American people, and the bulk of that people is now so considerable that it will hardly be modified profoundly in the future.

CHAPTER III

THE COMPOSITION OF THE WHITE POPULATION, AND THE DISTRIBUTION OF ITS DIFFERENT ELEMENTS

We have seen what elements have clustered about the primitive nucleus to form the American people. We will now endeavor to ascertain how the nation is at present constituted as a result of all this immigration. On the thirtieth of June, 1900, the date of the last census, the composition of the population was as follows:

	Total.	Per cent of white population.
Born in the U. S. of native parents	41,053,417	61.3
Born in the U. S. of foreign parents	15,687,322	23.4
Born abroad	10,250,049	15.3
Total white population	66,990,788	100
Colored population	9,312,599	
Grand Total	76,303,387	

Thus, the whites born of American parents form scarcely more than three-fifths of the total white population. However, out of the 15,687,322 persons in the United States of foreign parentage, there are 5,089,202 of whom only one of the parents was foreign, the other having been American; and 61,792 persons born abroad are similarly conditioned, while 8,909 individuals of American parentage were born abroad. This reduces by exactly one-third the proportion of foreign blood in the present American population, going as far back, of course, as one generation only. If we went further back, and considered not merely those inhabitants whose

fathers and mothers were born outside the United States, but those whose grandparents were born abroad, we should reach a much higher proportion. It might be remarked that the rating of the indigenous element is greatly assisted by the number of children in the country. The gentler sex is also proportionately more numerous among the native than among the foreign born.

One of the census tables gives the distribution, according to origin, of all the men in the United States more than twenty-one years of age. The total is 21,329,319, of whom 19,036,143 are whites. Of these 10,636,898, or only 55.9 per cent, were native born and of American parents; 3,466,721, or 18.2 per cent, were born of foreign parents, and 4,932,524, or 25.9 per cent, were born abroad. The elements of foreign origin thus aggregate 44.1 per cent of the whole. It should be said, however, that among the 3,466,721 described in the "Report" on the census as "native persons of foreign parentage," a goodly proportion must be of foreign parentage on one side only. According to what we have just observed for the total of persons of all ages and both sexes, the proportion should be about one-third. This would reduce to a little more than 40 per cent the proportion of foreign blood among the "men of voting age." If we go back a generation further, this proportion would doubtless be increased, but not to any considerable extent, for the new element that would thus be added would be composed of descendants of persons established in the United States before 1850. Now, in 1850 there were only 2,244,000 foreigners in the country out of a total of 19,500,000 whites, and, in 1840, fewer than 1,000,000 out of a total of 14,000,000 whites. The grandchildren of these foreigners cannot but form a feeble quota of the 10,500,000 "men of voting age" who were born in the United States of American parents.

The conclusion is inevitable that the greater part of

the blood that flows in the veins of the American people today is that of people who inhabited the United States in 1830 — before the beginning of the great wave of European immigration. At that time there were, throughout the Union, 10,537,000 whites. Ten years later the whites numbered 14,195,000 and only 599,000 immigrants had arrived during the decade. Allowing for the children born in the United States to these newcomers, and taking for granted that all these newcomers remained in the United States, it must be admitted that the 10,537,000 indigenous whites of 1830 must have become at least 13,500,000 by 1840 — a total increase of 28 per cent in ten years. During the last decade (1890–1900) the total increase of the native whites was not more than 15 to 16 per cent. Taking an intermediate figure of 20 per cent, which does not seem at all excessive, it would appear that the descendants of the white population of 1830 reach a total of 40,000,000 souls. Even granting an increase of but 16 per cent per decade a total of 34,000,000 would be attained; which is still a majority of the present white population.

It is well to observe, too, that heavy immigration is a relatively recent development. From 1830 to 1900 there have come to the United States from foreign parts a little fewer than 19,000,000 people, of whom about one-half, almost exactly 9,000,000, left their native land since the year 1880. Speaking broadly, these 19,000,000 immigrants arrived in the country during the past thirty years only, many to make but a temporary sojourn. This may be easily shown by taking, for example, the last decade. From June 30, 1890, to June 30, 1900, 3,687,564 immigrants arrived in the United States; but according to the census taken on the latter of these dates the country contained only 2,609,173 foreigners who had arrived during the preceding ten years. Now, supposing that the immigrants have a mortality of 20 per thousand per

year (which is a death-rate higher than that of the United States as a whole and would, besides, be excessive for a group containing few children of tender years and few old men and women), there would be, for an average sojourn of five years, a fall of 10 per cent in the total. Even so, there would remain 3,319,000 out of the 3,678,564 immigrants of the decade, whereas in reality there remain only 2,607,173. This means, of course, that more than 700,000, or about a fifth of the total, have left the country.

The question may be asked — is the proportion of departures always so high? I do not think it is. The past decade was marked by a severe and protracted industrial crisis. Immigrants found it difficult to secure work, and returned in large numbers to their native land solely for this reason. Moreover, Italian immigration, so prominent a feature of the past ten years, is notoriously temporary in character. Still, at other epochs — at the time of the Civil War, for instance — there were fairly heavy reflows from America to Europe. It is safe to say, and despite the fact that inadequate transportation facilities must formerly have operated as a serious obstacle to the return of immigrants to Europe, that the net immigration must always remain perceptibly below the gross, and that out of the 19,000,000 people who from 1830 to 1900 debarked in the United States, not more than 15,000,000 or 16,000,000 came to stay. This reduces the percentage of foreign blood to an appreciable degree. Besides this, the preponderance of men among the immigrants (of whom fully 60 per cent belong to the male sex) makes it certain that a number of them must remain without descendants.

Everything, then, leads to the conclusion that we make an underestimate when we place the descendants of the people who lived in the United States in 1830 at only 55 or 60 per cent of the present population. For

"1830" we might well write "the end of the eighteenth century," for immigration from the year of Independence to 1830 did not amount to more than a total of 400,000 people. The old American element therefore preserves its numerical superiority; it has not been overwhelmed by the newcomers, but has, on the contrary, been able to imbue them in large measure with its spirit and with its traditions.

This old American group, as I have said, is chiefly of British origin. Now, out of the 19,000,000 immigrants of 1830–1900 there have been no fewer than 3,024,000 English, Scotch and Welsh, and 3,871,000 Irish, or more than a third of the total immigration. If any of these have to any extent returned home, it is certainly not the Irish, who, besides, were the first to come on a large scale and, therefore, are among the groups having the most descendants. From this it follows that not only the greater portion of the native stock, but also a good third of the offspring of immigration, are from the British isles — that, in fact, more than two-thirds if not three-quarters of the white population of the United States is of British (including Irish) extraction.

The United States would, therefore, be heavily Anglo-Saxon — if the British Isles themselves were entirely Anglo-Saxon. The Irish, however, form in both countries an important non-Anglo-Saxon element, an element that is proportionately larger at the present day in the United States than in Great Britain. This must be borne in mind, for it is by no means the least of the salient causes of difference between the American and the English character. To the Celtic strain is due much of the mobility and vivacity of the people — counterbalanced in part by a Germanic influence making for stolidity, and even for heaviness, besides certainly making for an increase in the scientific spirit. Perhaps still more pro-

found are the modifications due to natural environment — to the violence and dryness of the climate, to the immensity of the distances and to contact with virgin nature. But the influences of race must not be overlooked, for these influences have been making themselves felt as much in the national temperament as in the national polity.

The table on the opposite page will assist in forming a better understanding of the share taken by different European nationalities in the formation of the American people. The upper section shows, according to the last census, the number of people of foreign parentage, whether or not born in the United States.[1] The lower section gives the distribution of the same group according to birth abroad and birth in the United States.

One of the most striking features of the table is the predominance of Germanic elements. Adding to the Germans proper the Scandinavians, the greater part of the Swiss, the Germanic Austrians, and the hundred and odd thousand Dutch comprised under the classification "different countries," we reach a total of nearly 11,000,000, which is more than 40 per cent of the whole. The English and English-Canadians make up a total of 4,300,000, and the Irish close to 5,000,000, so that the people of mixed origin naturally belong, for the greater part, to combinations of these elements. Summing up, nearly 21,000,000 Americans of foreign origin have come from the British Isles and from Germanic countries.

Up to recent years the next most numerous element was the French who, thanks to immigration from Canada, and with the aid of Belgians and French Swiss, show a total of more than 1,300,000, or five per cent of the whole. If to this be added the creoles of Louisiana, it will be seen that our race is still exerting a noticeable

[1] Almost all of those having one parent native but the other a foreigner are born in the United States. The statistics under examination show only 61,792 individuals of this class born abroad, and of these 30,935 were born in Canada.

THE ELEMENT OF FOREIGN EXTRACTION IN THE AMERICAN POPULATION IN 1900.

Countries.	Having both parents foreign.	Having one parent foreign, the other native.	Total.
Germany	6,244,107	1,585,574	7,829,681
Ireland	4,000,954	977,419	4,978,373
Great Britain	1,957,817	1,054,226	3,012,043
Norway, Sweden and Denmark	1,949,280	231,217	2,180,497
Canada (English)	675,841	625,955	1,301,796
Canada (French)	635,038	175,067	810,105
France	171,101	94,340	264,441
Switzerland	187,906	67,211	255,117
Italy	706,489	25,492	731,981
Austria	408,167	26,450	434,617
Bohemia	325,379	31,451	356,830
Hungary	210,300	6,091	216,391
Poland	668,514	19,157	687,671
Russia	669,764	15,412	685,176
Other Countries	689,696	154,150	843,846
Of mixed foreign parentage	1,338,207	.....	1,338,207
Totals	20,839,260	5,089,202	25,928,462

	Born abroad.	Born in the United States.	Percentage of total population of foreign birth.
Germany	2,674,398	5,155,286	29.9
Ireland	1,758,263	3,220,110	19.0
Great Britain	1,152,943	1,859,300	11.6
Norway, Sweden and Denmark	1,070,028	1,110,469	8.3
Canada (English)	440,640	861,156	5.0
Canada (French)	373,873	436,232	3.1
France	100,620	164,821	1.0
Switzerland	113,081	142,036	1.0
Italy	487,995	243,986	2.8
Austria	274,562	160,055	1.7
Bohemia	157,019	199,811	1.4
Hungary	143,633	72,758	0.8
Poland	377,753	309,918	2.6
Russia	422,263	262,913	2.6
Other Countries	414,974	428,872	4.1
Of mixed foreign parentage	279,305	1,059,602	5.1
Totals	10,241,140	15,687,322	100.0

influence in the United States. Slavonic peoples since 1900 have become a little more numerous than our own compatriots, although it should be pointed out that a very large proportion of the immigrants from Russia are not Slavonic, perhaps 50 per cent being Finns and Jews. Italians have immigrated to America in recent years only; but their number is increasing with extreme rapidity.

A tendency to fusion of nationalities is clearly marked. While 9,600,000 individuals born in the United States had as parents foreigners of some one nationality, there were, according to the census figures for 1900, no fewer than 5,027,000 with foreign parentage only on one side, and 1,059,000 with foreign parentage on both sides but of mixed nationality. Mixed marriages, therefore, are very numerous. It is true, as pointed out by the "Report," that in many cases the native who weds a foreigner was originally of the same nationality as the latter; and it is among the very nationalities that for many years have furnished the strongest contingents of immigrants that these marriages are most numerous, for the newcomers naturally find many of their race already in the United States. English-Canadians take the lead in this respect. Out of one hundred individuals of English Canadian origin, whether or not born in the United States, 48 per cent have as one parent a Canadian and as the other a native. Next come the English, 36.4 per cent; the French, 35.5 per cent; the Scotch, 32.4 per cent; the Welsh, 29.7 per cent; the Swiss, 26.3 per cent; the Germans, 20.3 per cent; and the Irish, 19.6 per cent. At the other end of the scale, are the most recent immigrants: the Russians 2.2 per cent; the Poles and the Hungarians, 2.8 per cent; and the Italians, 3.5 per cent. Scandinavians have intermarried with natives to a very small extent; only 7.9 per cent of the Swedes make mixed marriages, only 13.1 per cent of the Norwegians, and only 13.5 per cent of the Danes.

Geographical distribution has a great effect on the fusion of different races, for they have not settled in the same sections to an equal degree. Throughout the last century, indeed, certain parts of the United States received an extremely small quota of immigrants, so that their population remains almost entirely composed of native Americans. In other parts, however, people of foreign origin are actually in a majority. The following table will show what is meant. By "people of foreign origin" is understood, of course, all whose father and mother, or father or mother, were born outside the United States, whether they themselves were born within the United States or not:

DISTRIBUTION OF THE WHITES OF FOREIGN ORIGIN ACCORDING TO THE FIVE GEOGRAPHICAL DIVISIONS.

	Whites of foreign origin.	Percentage of white population.	Percentage of total number of whites of foreign origin.
North Atlantic	10,721,034	51.9	41.5
South Atlantic	598,430	8.9	2.3
North Central	11,627,170	45.1	45.0
South Central	1,061,503	10.8	4.1
West	1,852,697	47.8	7.1
Totals	25,937,371	38.7	100.0

It appears that there are comparatively few foreigners in the south, where immigrants are averse to settling not only on account of the climate, but because of the presence of so many negroes, who were slaves until 1865. If we examine not merely the five great divisions, but the several states, differences of still larger extent will be found, for the proportion of whites of foreign origin varies from 1 per cent in North Carolina to 78.9 per cent in North Dakota. People of foreign origin are in a majority in three large groups of contiguous states. One of these is in the east, near the principal ports of debarkation and in the chief industrial region. This group includes New York with 60.1 per cent of people

of foreign origin, New Jersey with 54.4 per cent, Connecticut with 58.2 per cent, Rhode Island with 65.4 per cent and Massachusetts with 62.7 per cent. The second group stretches along the Canadian frontier from the Great Lakes to the Rocky Mountains. The seven states composing it are Illinois, 52 per cent; Michigan, 57.1 per cent; Wisconsin, 71.5 per cent; Minnesota, 75.5 per cent; South Dakota, 64.2 per cent; North Dakota, 78.9 per cent, and Montana, 58.9 per cent. The third group comprises four states of the Rocky Mountain and Pacific Slope region: California, 54 per cent; Arizona, 51.7 per cent; Nevada, 57.3 per cent; and Utah, 61.8 per cent. It is not without interest to note that on the Pacific side the states which hold the most people of foreign extraction are in the south, instead of in the north, as is the case in the Atlantic and Central regions. The majority of the foreign-born of Arizona and a large number of those of California are from Mexico. The fact that these states of the extreme south-west are richer than the states of the extreme north-west is doubtless the reason why they have attracted more immigrants.

Opposed to the states just mentioned is to be found, in the south, a compact block composed of Virginia, the two Carolinas, Georgia, Alabama, Mississippi, Tennessee, Arkansas and the Indian Territory, in which persons of foreign origin form less than 5 per cent of the total white population. However, three states of the extreme south — Florida, Louisiana and Texas — have respectively 14.5 per cent, 21 per cent, and 19.2 per cent whites of foreign birth. The first and the last named states are of recent colonization; the second draws immigrants by reason of its large port, New Orleans.

What, now, is the distribution of the different nationalities? Germans occupy in large numbers the states bordering on the Great Lakes, the middle Mississippi and the lower Missouri — Ohio, Indiana, Illinois, Michigan,

Wisconsin, Iowa, Missouri, Nebraska, and Kansas. In these states their proportion to the total of foreign origin varies from 32 to 56 per cent, or more than the average. In Wisconsin there are 710,000 German-Americans out of 2,058,000 inhabitants, or more than a third of the population. In all ten states there are 4,460,000 German-Americans. German-Americans are also to be found to the number of 1,217,000 in New York, 297,000 in New Jersey and 643,000 in Pennsylvania — the three states continuing the above zone to the east. On the other hand, there are few German-Americans in the manufacturing states of New England. In the extreme west they number only 326,000 out of 1,851,000 foreigners; but they constitute almost half of the few foreigners to be met with in the south.

North-west of the German region is to be found the great Scandinavian centre, composed of Minnesota, where Scandinavians number 516,000, or more than 30 per cent of the total population; North Dakota, where they number 93,000 out of 311,000 inhabitants, 72,000 out of the 93,000 being Norwegians, and South Dakota, where the number is 78,000 out of 380,000. There are also 238,000 Scandinavians in Wisconsin, 287,000 in Illinois, and 173,000 in Iowa. In these six states are living two-thirds of the Scandinavians of the United States. Of all immigrants they are the ones who most seldom remain in the east or in the cities, and, it might be added, Americans esteem them above all other immigrants.

The Irish are distributed quite differently. Their great centres are New York (in which are 1,176,000 Irish-Americans mostly of urban settlement) and the manufacturing region of New England. In Massachusetts, Rhode Island and Connecticut, the Irish, with 940,000, form almost a quarter of the total population of the three states. Of all persons of Irish descent more than

60 per cent — 3,114,000 to be exact — are located in the North Atlantic division. Wherever there are large cities the Irish are to be found (in Illinois, 372,000; in Ohio, 203,000; in California, 152,000), but they seldom settle in rural districts.

The English and Scotch are widely scattered. Since theirs is the national tongue they doubtless feel less need of concentration. They are proportionately most numerous at two territorial extremes: in New England, the industrial region, and in the far west, whither their adventurous temperament impels them, and where they find employment in the mines. English Canadians are to be met with everywhere, but especially along the border.

French Canadians are massed in the north of New England. Out of their total of 810,000 no less than 470,000 live in Maine, New Hampshire (where they form almost a fifth of the population), Vermont, Massachusetts and Rhode Island, usually working in the mills but not infrequently tilling the farms formerly tilled by New Englanders who have moved west. There are about 36,000 French Canadians in Connecticut, 69,000 in New York and 75,000 in Michigan.

Of other nationalities either the representation is sparse or the immigration is quite recent, so that it is perhaps a little premature to attempt to draw any definite inferences from their present distribution. One of the complaints voiced by Americans against immigrants from the south and east of Europe is that they mass themselves in cities. To a certain extent time may make a difference, but at present it must be admitted that the complaint seems to have a solid foundation in fact. A survey of the distribution of the foreign born population, according to the figures of the successive censuses of 1880, 1890 and 1900, shows very plainly that the destination of immigrants has changed with the change in their origin. The distribution, it need hardly be said, indi-

cates the regions whither the newcomers by preference betake themselves. Now, in 1880, out of the 6,679,000 foreigners [1] who were then in the United States, 2,814,000 were located in the North Atlantic division — that is, the industrial and urban region comprising the states bordering on the sea, from Pennsylvania to Canada; 2,916,829 were in the North Central division — covering the entire northern basin of the Mississippi, from the Alleghanies to the Rockies, and primarily agricultural in character, although a great industrial development is making itself felt in certain sections; 500,062 were in the Western Division — the Rocky Mountain and Pacific Slope country, a mining and agricultural region.

The last named divisions — the North Central and the Western — are the true zones of colonization. It is evident that by proceeding thither, rather than by massing themselves in the large cities of the North Atlantic division, immigrants can best assist in developing the resources of the country. Much could also be accomplished in the South Atlantic division and still more in that of the South Central — the lower basin of the Mississippi and Texas. But, as I have said above, the presence of the negroes keeps Europeans out of this region: in 1880 there were only 174,000 foreigners in the former division, and 274,000 in the latter.

All in all, the distribution of foreigners was satisfactory in that year. The North Central states contained the largest number, and next came the North Atlantic ones — which was only natural, for a certain number of immigrants must necessarily give themselves to urban callings, while others again must remain at the ports of debarkation until they secure work. In 1890 similar conditions prevailed. Out of the 9,248,000 foreigners then in the country, 4,060,000 were in the North Central

[1] It should be clearly understood that the reference here is not to persons of foreign origin, but to persons of foreign birth.

division, 3,888,000 in the North Atlantic and 770,000 in the Western — or, to put it otherwise, 44.5 per cent of the increase in the number of foreign inhabitants was found in the first named division, 42 per cent in the second, 10 per cent in the third. But in 1900 a marked change was seen. Out of 10,460,085 foreigners the North Atlantic division held 4,672,000, absorbing 80 per cent of the total increase; the North Central, with 4,158,000, had taken only 9 per cent of the increase, and the Western, with 846,000, less than 7 per cent. The inevitable conclusion is that most of the immigrants, instead of going into the interior, had remained in the neighborhood of the coast, or had gathered together into the large cities.

From 1890 to 1900 the proportion of foreigners to the total population of the United States fell from 14.8 to 13.7 per cent. It showed an increase in only eight states and territories — Oklahoma and the Indian Territory in the south-west, where it was still very low (less than 4 per cent); and six states out of the nine comprising the North Atlantic division: Maine, New Hampshire, Massachusetts, Rhode Island, New Jersey, and New York. In the last named state the gain was almost imperceptible. Out of six states which have more than a quarter of their population foreign born, two, North Dakota, which comes first (35 per cent), and Minnesota (28.5 per cent), are in the North Central division; the four others being in the North Atlantic. They are Rhode Island, 31.4 per cent; Massachusetts, 30.2 per cent; Connecticut and New York. The ancient home of the Puritans, New England, is today the least American section of all the United States. It has become a Capernaum wherein all manner of foreigners mingle, and where, by curious irony, "Papists"— Irish and French-Canadians — have thickly settled.

The tendency to urban concentration must not be

attributed alone to a change in the origins of immigration. This change, it is true, is significant. The new strata of immigrants have not the innate resourcefulness possessed so highly by the old arrivals, and they are much more gregarious, fearing isolated effort in the western solitudes, whither are drawn the Scandinavians, inured to a rude climate, Scotch and many Germans. But that which also has a powerful effect in attracting the newcomers into the large cities is the recent industrial development not alone of the United States but of Europe. There are more immigrants coming to the United States from large cities, because there are larger cities in Europe today than there used to be, and there are also larger cities in the United States to receive them and give them work.

These two causes taken together account for the fact that an extremely high proportion of foreign born people is to be found in the cities, and especially in the large and medium sized cities of the United States. Out of the 10,460,085 foreigners enumerated by the census of 1900, 5,147,716, or almost half, exactly 49.2 per cent, resided in the 161 cities of more than 25,000 inhabitants, the total population of which, 19,757,168 inhabitants, forms only a little more than a quarter, exactly 25.9 per cent, of the American population.[1]

In these cities of more than 25,000 inhabitants, foreigners therefore represent 26.1 per cent of the population, or 5,147,716, out of 19,757,618. But the proportion is much higher in certain factory towns of New England, and especially in the mill cities of Massachusetts. At

[1] The foreigners showing the greatest tendency to urban concentration are the Russians who total 424,000 in all, and of whom no less than 317,000, or 74.9 per cent of the whole, are found in towns of more than 25,000 inhabitants. Next come the Poles (383,000 with 62 per cent in towns), the Irish (1,618,000 with the same urban percentage), the Italians (484,000, also with 62 per cent in towns), the Austria-Hungarians (519,000, with 54 per cent in towns), and the Germans (2,666,000, with 50.2 per cent). At the other end of the scale come the Scandinavian peoples (1,064,000, with an urban percentage of only 31), the French-Canadians (395,000, with 37 per cent in towns), and the Swiss (115,000, with 35 per cent).

Fall River, the centre of the cotton goods industry, out of 104,863 inhabitants no fewer than 50,042, or 47.7 per cent, are foreigners, of whom there are 20,172 French-Canadians, 12,268 English and 7,317 Irish. At Lowell, another centre of the same industry, the situation is similar, there being 40,974 foreigners out of a population of 94,969. In some of the streets of these cities I noticed that nearly all the sign-boards were in French, and in some factories I heard little but our language. It is sad to think that it must eventually fall into disuse.

The rural population, and the population of the small towns, remain, on the other hand, thoroughly American by an overwhelming majority. Out of the 56,545,769 persons who live outside the cities of more than 25,000 inhabitants, only 5,312,369 are foreign born. That is to say, nine-tenths are Americans by birth.

As a matter of fact, native Americans have been the colonizers of the United States. The "Report" contains some interesting tables which give, for each state, the number of inhabitants born in that state, born in other states, and born abroad. It appears that in almost every state the number of persons falling under the second classification is greater than that of persons coming under the third. The reverse is true in only fourteen states, and among the fourteen appear eight of the nine states of the North Atlantic division, where it is not a question of colonization, but of concentration in the industrial cities. Further, in Illinois, Michigan, Wisconsin and Minnesota the large cities of Chicago, Detroit, Milwaukee, Saint Paul and Minneapolis are chiefly responsible for a heavy influx of foreigners, although it should be added that all but the first of these states, as well as North Dakota, which has no large cities, have a great attraction for Scandinavians and Finns, who are accustomed to intense cold. As to Utah, the last state in which over-sea colonists are in the majority, eccentric persons from

all countries have gathered there to swell the ranks of Mormonism.

Everywhere else the native American has been the colonist. The further one advances toward the Pacific, and especially toward the south, the more the native American is in evidence. In Oregon and Washington there are two and a half to three times as many Americans originally from other states, as there are foreigners; in Nebraska two and a half times as many, in Kansas six times, in Texas five times, and in Oklahoma twenty times. A certain amount of adaptation is necessary before one can entrust oneself to the solitudes of the West — it might almost be said that a successful colonizer of this vast region must be born to the task. According to the census tables, it would also seem that the movement of colonization has taken place by successive waves. The inhabitants of the states bordering on the Atlantic pass little by little to the country between the Alleghanies and the Mississippi, where they occupy territory vacated by colonists who have crossed the great river; the states of the Pacific slope, in turn, being colonized from states situated between the Mississippi and the Rocky Mountains. The work of colonization is thus being constantly carried forward by the best equipped people. One is tempted to say that the majority of men, even those most enterprising of men, the Americans, ill accommodate themselves to abrupt changes of environment. In leaving densely settled regions, they hesitate before throwing themselves into the midst of a virginal country; yet, once they have come into contact with it, they learn to love it, and they follow it as it retreats before civilization.

CHAPTER IV

THE NEGRO POPULATION AND THE RACE QUESTION

If the appearance for some years past of immense numbers of immigrants from the east and south of Europe has disquieted the Americans, it may be readily conceived how much more troubled they are by the presence on their soil of a block of 9,000,000 people belonging to an inferior and unassimilable race, or a race that must prove unassimilable for a long time to come.

For several years the troublesome problem of the relations between the whites and blacks, and of the rights of the latter has been presenting itself bluntly to the American people. For twenty years it had seemed to slumber. After the terrible crisis of the War of Secession, after the excesses of the "Carpet Bagging" government of the former slaves, who allowed themselves to be led by adventurers of all sorts, preying on the Southern states so long as federal troops remained in them, the white inhabitants of these states again raised themselves into power. To be sure, they did not do so without occasionally using violence to keep the negroes away from the polls, tho the blacks were, as a rule, quite resigned to finding themselves deprived of political rights that theoretically belonged to them.

By a sort of tacit agreement everybody was blind to this situation, which could not exactly be called legal, but which had the practical advantage of assuring tranquillity and a decent government to the South. The essential purpose of the war had been attained, with the liberation of the slaves; the ruin wrought by it had been

too great, the difficulties of the reconstruction period too formidable, and the negroes, just lifted from slavery, were manifestly too little equipped for exercising functions of government, for men of the North to be inclined to reopen the era of civil discord in order to ensure to the enfranchised blacks rights about which they troubled themselves little and which they did not even comprehend. As there was seldom among them one who was well-educated, the question of appointing them to public office did not weigh heavily upon the Federal government. In any event, there seemed to be an understanding that this question should not be raised. Besides, race prejudice was, and still is, not less active in the North than in the South. In New York and even in Boston, negroes are excluded from leading hotels and from the best seats in the theatres. Even at reunions of veterans of the Civil War one may see old black soldiers separated from the whites with whom they had fought, shoulder to shoulder, for the abolition of slavery.

It would seem, then, that time, instead of improving the relations between the two races, has only embittered them. For a few years back certain Southern states, and notably those which contain the largest number of negroes, have ceased to content themselves with forcibly keeping the negro away from the polls. They would, if you please, give legal consecration to disfranchisement. Since the Federal Constitution enacts that no man shall be deprived of the right to vote "on account of race, color, or previous condition of servitude," these states seek to evade this clause of the Constitution by reserving the right of suffrage to those who can read and write, or meet certain other requirements. This is the method of procedure adopted by Louisiana and South Carolina. In Mississippi the right to vote is reserved to those who can read or "are capable of understanding the state constitution." The attitude of the examiners to white

and black candidates respectively is not difficult to imagine. Virginia has a mixed system, combining the conditions laid down by the states just named, and North Carolina has only recently inserted a similar clause in her constitution. The recent industrial development of the South has served to render the race problem still more acute. White and black workmen look askance at one another. The former complain of the competition of the latter, and often refuse to admit them into their trade unions. Crimes and lynchings multiply. It is significant that the whites who emigrate from the North to the South, as well as the lower classes of the Southern white democracy — the "poor whites" — regard the negro with more animosity than do the old planter aristocracy. To this democratic stratum is chiefly due the adoption of laws restricting the suffrage.

Public opinion being thus conditioned, it is not difficult to comprehend the excitement occasioned by President Roosevelt in entertaining a negro at dinner at the White House, and this altho the negro, Mr. Booker T. Washington, is a colored man of eminent attainments. It is also easy to comprehend the outburst that followed the President's nominating another negro, Dr. Crum, to be collector of the port at Charleston, the principal city of South Carolina. Not merely the South and the Democratic party, to which by far the greater number of Southern whites belong, exclaimed aghast, but the nomination was decried as impolitic by many members of the Republican party, the President's party, and the very party that waged the war for the maintenance of the Union and the abolition of slavery. The United States Senate, in which the Republican party holds nearly two-thirds of the seats, refused to confirm Dr. Crum's nomination, to which the President stubbornly adhered. The conflict became prolonged, provoking profound feeling

in the South and unrest elsewhere in the American political world.

Strictly speaking, the President was assuredly in the right. If a colored man possesses the necessary qualifications, why not appoint him to office? Especially would it seem a duty to name him in a country whose Constitution has, since 1865, formally forbidden any race distinctions, civil or political. But, argued many Americans of both parties, however legal this nomination may be, is it expedient? By bringing these irritating questions into the political arena again the benefits obtained from twenty years of a conspiracy of silence will be lost, the social peace of the South troubled and the whole region thrown into a state of anxiety.

Quite naturally, Southern whites fear that a government which calls negroes to public office is also going to see that the political rights of these negroes shall be respected; that it will compel the Southern states to allow the negroes to participate in elections, and that it will effect this either directly through a Supreme Court declaration that the restrictive laws are unconstitutional, or, if the Supreme Court should decide otherwise, by applying that clause of the Constitution which reduces the congressional representation of those states in which universal suffrage does not prevail. The question has already been raised in certain quarters, but everybody seems to act as a unit in silencing those raising it. Should the President take the matter in hand, however, it could not be kept out of the realm of debate, and then, no matter how it might be temporarily adjusted, it would remain an open question for the future. An era of great excitement in the South would be begun and this might lead to the gravest trouble. That is why many of those who have nothing in common with the negrophobes blamed President Roosevelt for his action in the Crum case, and had behind them the weight of public

and even of Northern opinion. In order to appreciate just why this was the case, it is necessary to comprehend the facts of the race question as it is presented in the United States.

The 76,303,387 people who were living in the United States on the day of the census, June 30, 1900, were divided into 66,990,788 whites, 8,840,789 blacks, 119,050 Chinese, 86,000 Japanese and 266,760 Indians. There were, therefore, 9,312,599 people of color, or non-Caucasians, with the negroes immensely in the majority, or, to be more exact, people of negro descent, for among the blacks are pitilessly included not only mulattos but quadroons and octaroons, everybody, in fact, through whose veins flows a drop of negro blood, the least trace of which is instantly detected by the practised eye of the Americans.

The remaining people of color need to be considered only in connection with the American dependencies and a few of the Western states. Out of the 119,050 Chinese enumerated more than 45,000 are in California, more than 10,000 in Oregon, and more than 3,000 in Washington, or a total of nearly 60,000 in the three states bordering on the Pacific. In Alaska there are 3,000 Chinese, and nearly 26,000 in the Hawaiian Islands. There thus remain only about 20,000 scattered through the large cities of the rest of the Union. Their presence having been deemed dangerous to the Western states a law was adopted which has had the effect of almost totally putting an end to their immigration, and there is no longer a Chinese question in the United States. Of the 86,000 Japanese, 61,000 are in Hawaii, 10,000 in California, 5,600 in Washington, 2,500 in Oregon, 2,400 in Montana, and 1,300 in Idaho; so that the other states, taken together, contain not more than 2,000. The Japanese are not excluded as are the Chinese, but it is extremely probable that if they made their presence too strongly

felt a friendly understanding to restrict immigration would be arrived at between the American and Japanese governments — at least so far as the continental portion of the United States is concerned. This is the course that has been adopted by Japan and Canada.

The Indians, the ancient owners of the soil, are no longer a source of uneasiness. In glacial Alaska they form nearly half of the population (29,000 out of 63,000), but nowhere else do they form even a quarter. In Arizona they number nearly 26,000 out of 1,220,000, or a little more than one-fifth. In the Indian Territory there are only 52,000 Indians out of a population of 392,000, or less than one-seventh. In five other states — Montana, South Dakota, Nevada, New Mexico, Oklahoma — they constitute 5 to 10 per cent of the total number of inhabitants. These are Rocky Mountain states and states of recent colonization. Several thousand more are scattered through the majority of the states west of the Mississippi. In the East, however, the number of Indians is infinitesimal. Leaving Alaska out of the question, it would seem that the Red Man is steadily becoming less in evidence. In 1890 there were 248,000 Indians, in 1900 only 237,000. The more progressive are merging with the whites, the others are disappearing. They can be a factor neither for good nor for evil in the evolution of the United States.

Having thus eliminated all other peoples of color we find ourselves confronted with the negro race, which forms 11.6 per cent of the population of the United States, the whites totalling 87.8 per cent. Each census since that of 1810 has shown a steady diminution of the black proportion, the percentage in 1810 having been 19. At first sight, this would seem to rob the race question of its disquieting features. But it is significant that the fall of the black proportion was much less from 1890 to 1900 than it had been from 1880 to 1890; the decrease for

the last decade of the nineteenth century having been from 11.9 to 11.6 per cent, as against a decrease from 13.1 to 11.9 for the preceding decade. It is important to remember that immigration, which since the abolition of the slave trade has played no role in the increase of the blacks, is an important contributory factor in the increase of the whites. There were far fewer immigrants from 1890 to 1900 than there had been from 1880 to 1890. During the decade 1890–1900 the blacks passed from a total of 7,488,000 to a total of 8,840,000, an increase of 18.1; the whites from 55,166,000 to 66,990,000, an increase of 21.4 per cent. This difference is not very great. Had it not been for immigration, the black population would doubtless have increased at a much more rapid rate than the white.

Indeed, if we look not at the total of the white population, but at the total of those of the whites who have been born in the United States of parents who were themselves born there, we find an increase of but 18 per cent — the figures being 41,053,000 in 1900, and 34,514,000 in 1890. It should be said, moreover, that the increase of 6,539,000 thus shown represents not merely the natural increase in ten years of the 34,514,000 really native whites who were in the United States in 1890, but the increase in the native element through births among the numerous group of "whites born in the United States of foreign parents," a group which totalled no fewer than 11,515,000 persons in 1890. Taking this into consideration it is unquestionable that the blacks are more fecund than the whites. Here is the first serious factor in the race question.

To understand just how serious the problem is, it is necessary to examine the distribution of the negro race through the different sections of the country. And, first of all, it appears that in the South Atlantic division there are 3,729,000 negroes, forming 35 per cent of the popu-

lation, and in the South Central, 4,193,000, or 29.8 per cent. Thus, nine-tenths of the negroes of the United States make their homes in the Southern states, there being not more than 900,000 scattered through the rest of the country, where they constitute less than 2 per cent. These round figures, however, give only an imperfect idea of the extent to which the negroes are massed in some sections. The following table shows how the population is divided between the whites and the blacks in certain states, the figures indicating the proportion of negroes:

Mississippi	58.5
South Carolina	58.4
Louisiana	47.1
Georgia	46.7
Alabama	45.2
Florida	43.7
Virginia	35.6
North Carolina	33.0
Arkansas	28.0
Tennessee	23.8
Texas	20.4
Maryland	19.8
Delaware	16.6
Kentucky	13.3
Indian Territory	9.4
Missouri	5.2
Oklahoma	4.7
West Virginia	4.5
New Jersey	3.7
Kansas	3.5

Thus, in two states the negroes are actually in the majority, while in four others they form more than 40 per cent of the population. These six states constitute a block stretching from the Atlantic seaboard to the Gulf of Mexico, south of the thirty-fifth parallel. To the north-east of this block, in Virginia and North Carolina; to the north, in Tennessee and Arkansas; to the west, in Texas, the black proportion likewise remains high, running from 20 to 36 per cent. Further north again, if one take the band of states and territories, contiguous

to the preceding, and formed by Delaware, Maryland, West Virginia, Kentucky, Missouri, Indian Territory and Oklahoma, a significant black proportion will still be found. Finally, New Jersey, Pennsylvania, Ohio, Indiana and Kansas have above 2 per cent of their population black. The negroes, then, radiate from six states bordering on the South Atlantic and the Gulf of Mexico. Here is their centre, here more than half the population is composed of colored people, for, of 8,852,000 persons in these states, 4,433,000 are colored.

In the geographically well-defined region comprised by these six states of South Carolina, Georgia, Florida, Alabama, Mississippi and Louisiana, there thus exists a black majority — very small, it is true, but none the less a majority. We can readily understand the vexation felt by the whites of this region whenever the question of the rights of the blacks is raised. Nor is it difficult to comprehend the mischievous social condition arising from the juxtaposition of the two races, and the barrier to progress erected by the presence of this immense mass of negroes who are still far from being civilized in the true sense of the term. However, we must continue our analysis of the racial distribution, which is very unequal, even in the region in question.

Physically, the south-eastern portion of the United States is divided into two zones, the one composed of humid, sometimes swampy plains, stretching over a wide area along the Atlantic ocean, the Gulf of Mexico and the banks of the Mississippi, the other consisting of the Alleghany Mountains and their broad terraces. In the latter, which covers a large extent of territory in Virginia, South Carolina and Tennessee, less in Alabama and Georgia, and still less in South Carolina and Mississippi, there are comparatively few negroes. On the other hand, the flat country teems with them, certain sections being almost wholly given over to their occupancy. This

is clearly shown by the tables of the last census. The number of blacks is more than double the number of whites in thirteen of South Carolina's forty counties, in twenty-six of Georgia's one hundred and twelve, in two of Florida's forty-five, in twelve of Alabama's sixty-six, in twenty-seven of Mississippi's seventy-five, and in eight of Louisiana's fifty-nine. The counties in which the blacks thus largely predominate form a continuous band, the "Black Belt," which extends from Mississippi to South Carolina. To the north-east even, it continues in a measure, the number of blacks being double that of whites in one county in North Carolina and in two counties in Virginia; while, to the north-west and west, ascending the valley of the Mississippi, and on the other side of the great river, the traveler will find six counties in Arkansas, two in Tennessee and one in Texas with twice as many blacks as whites. At certain points the difference is enormous: the blacks are six times more numerous than the whites in one Arkansas county, seven times more numerous in an Alabama county, nine times more numerous in the county of Beaufort in South Carolina, and sixteen times more numerous in that of Issaquena in Mississippi.

Often when they find themselves in a helpless minority the whites emigrate and establish themselves elsewhere, their vacated holdings being at once taken up by blacks. The two races, in fine, tend to separate like liquids of different densities which can never mingle. A certain county in Alabama was inhabited by 25,588 blacks and 5,645 whites in 1880; today it has 30,889 blacks and only 4,762 whites. Another had 12,784 blacks and 4,587 whites; it now has 18,870 blacks and 4,252 whites. Moreover, in Mississippi the black population in one locality has increased in twenty years from 7,997 to 21,031, while the white has grown only from 2,230 to 2,796. Thus it will be seen that there is a tendency to

the creation of almost exclusively black zones of population. A grave peril lurks in this. Cut off from the influence of the whites, the blacks make no progress, and even tend to relapse into barbarism. Such a relapse has actually occurred in Haiti as the traits and customs described by M. Paul Bourget in "Outre-Mer" bear witness.

That there is really a movement in the direction of concentrating the black population in the extreme South may be readily established. We find that the "upper" Southern states [1] lose negroes by emigration. When the census of 1900 was taken it was discovered that of the 3,829,000 living negroes who had been born in that section, only 3,205,000 were still resident there. This would indicate that 624,000 had emigrated. But it appears that 90,000 negroes born in other states had come there to live, so that the net emigration was 534,000 persons. On the other hand, the "lower" Southern states had received from other states 276,000 negroes and had seen only 128,000 depart, the net immigration having been 148,000 persons. Over against this must be set the fact that during the same period 414,000 negroes, originally from the South, and chiefly from the "upper" states, had established themselves in the North, while only 28,000 Northern negroes had settled in the South.

By the side of the concentration movement, therefore, there is a movement of dispersal in the direction of the North. It is from Virginia, the Carolinas, Maryland, Kentucky and Tennessee that the negroes are departing to the North and to points further South. For that reason the black proportion in the population of these states has diminished in the interval between the last two censuses, and has been diminishing ever since 1880, if not since an even more remote date. And for the same reason it has

[1] The upper Southern states are Delaware, Maryland, the two Virginias, the two Carolinas, Kentucky, Tennessee and Missouri. The lower states are Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas and Texas.

been increasing in the "lower" states, except in Louisiana and Texas, where there has been a noticeable inflow of whites from the North and from Europe. In states of the extreme South black immigrants have chiefly settled in rural districts, where the proportion of negroes is much larger than in towns. In the North the reverse obtains, the negroes flocking to towns where they earn a living as domestic servants and in other inferior occupations.

How shall the question raised by the presence of these 9,000,000 negroes, and especially by their concentration in the extreme South, be answered? Doubtless education can assist in solving the problem, but it is vain to hope that the negro will be raised in a few years, or even in several generations, to the culture which our ancestors required centuries to acquire. If this could be done, it would prove the inferiority, not of the black race, but of ours — which we should not willingly admit, and which would assuredly seem paradoxical. In truth, there is no definite solution of a problem which doubtless must cause much trouble. Its existence is a barrier to immigration into one of the richest sections of the country, and shackles progress. It is the punishment of slavery.

CHAPTER V

THE NATURAL INCREASE OF THE AMERICAN PEOPLE AND THEIR BIRTH-RATE

It would be well if we could close these studies of the American people by a searching examination of their birth-rate, that factor so important in determining the development of the strength of a nation. Unfortunately, as is pointed out by the "Report" on the twelfth census, "the schedules relative to births are the most incomplete and the least satisfactory of all considered in the present Report." A number of states are without laws compelling the civil registration of births, some have not even registration offices, and even where such offices exist, and where legal requirements call for the declaration of births, it is doubtful, if we are to accept the statements of the "Report," that such declarations are made with sufficient regularity to warrant serious deductions. One is therefore forced to compute the birth-rate by indirect means, giving only approximate results. Still, it would be so interesting and instructive to ascertain if possible what effect the American environment has had in this respect, that the attempt should certainly be made, despite the imperfect means at command.

An idea which naturally springs to mind is that the enumerators of the census might have been instructed to ask every citizen to state if any children had been born to him in the course of the ten years immediately preceding the census. That was the method adopted to ascertain the number of deaths. But, even in regard to deaths, replies were not always elicited. The census officials believe it would be still more difficult to obtain

accurate information respecting births. The authors of the "Report" know their fellow-citizens better than we do and we must accept their statement of the case, altho we cannot but feel surprised.

In any event, it is certain that the birth question was not raised in the census of 1900. The census figures, however, give the number of children less than one year in age who were living on the day the census was taken. By noting the number of deaths and the age at which death occurred, we should be able to deduce from this the number of children born during the year preceding the census and the number of those who had died within the year, and, by adding the totals, obtain the exact number of births in the course of the year. Unfortunately, the "Report" informs us, neither of these factors so essential to our inquiry, is known with exactness. As the gaps and errors in the bulletins of the census show, the second can be determined only very roughly, and even in regard to the first and more important (the number of children born during the year) generous allowances must be made.

For want of better returns we must content ourselves with the statistics available. It appears that on the first of June, 1900, there were in the United States 1,912,863 children aged less than one year, and that 136,269 children had been born and had died in the course of that year. This would put the number of births at 2,049,132, which gives a birth-rate of 27.1 per thousand inhabitants as against 26.9 per thousand as calculated by the same method for the year 1889–1890. The results by states do not differ materially for the two censuses, there being no abnormal variations, so that it is reasonable to suppose that the percentage of error is about the same today as it was ten years ago. Is this percentage of error identical in the different states? That is difficult to say, and the "Report" does not venture upon any hypothesis in regard to it. It would seem that there ought to be

more errors of omission (and there can be few of any other kind) in the South, where a majority of the negroes and not a few of the whites are primitive and illiterate. Perhaps a similar cause of excess of error prevails in New York and neighboring states where there are many immigrants of a backward type. On the other hand, in the Central, Western and North-Western divisions, where the inhabitants taken in the mass are in an advanced state of civilization, the declarations embodied in the " Report " may be deemed more nearly in accordance with the facts.

It must be said that the real birth-rate of the people of the United States is higher than 27.1 per thousand. An analysis of the statistics relative to mortality leads the authors of the " Report " to conclude that the death-rate averaged about 17.4 per thousand during the ten years 1890–1900. This figure has been well established and may be freely accepted. But with a birth-rate of only 27.1 per thousand the natural increase of the population would be but 9.7 per thousand per year, or almost exactly 10 per cent in ten years. At this rate the effect of natural increase would have brought the population by 1900 up to 69,300,000. To this must be added the number of people who, on the day of the census, had been living in the United States for a period less than ten years, a total of 2,600,000 individuals. There must still be included the number of children born to these newcomers, and, as we shall soon see, the birth-rate of these is high, over 40 per thousand, and perhaps nearly 50 per thousand. In this there is nothing surprising, for in addition to the fact that the immigrants include few old men and few children, they are in great measure representative of the most prolific nations of Europe. It is true that there are comparatively few women in their ranks, but over against this we may set the absence of aged and immature males. Supposing an average residence of five years and a birth-

rate of 50 per thousand, or 5 per cent per year, or 25 per cent in five years, we obtain a natural increase to this group of 650,000. Of course some of these will have died. But let us suppose that all are still alive. Even then we should have a grand total of but 72,550,000 as the population of the United States in 1900, whereas the actual population, exclusive of Alaska and Hawaii, was 76,086,000, or 3,500,000 more than our calculations give.

It is clear, then, that the birth-rate is superior to 27.1. In fact, in order to account for the difference, it is necessary to admit that the natural increase has been not 6,300,000 souls, but nearly 10,000,000, or 15.7 per cent of the population of 1890. By the excess of births over deaths this corresponds to an annual increase of 14.7 per thousand. If the death-rate is really 17.4 per thousand, it follows that the birth-rate is 32.1 per thousand. Let us suppose, for the sake of argument, that the immigrants who arrived in the census interval have a birth-rate not of 50 but of only 25 per thousand, their share of the natural increase being 325,000 children. We should now be forced to conclude that the natural increase of the population of 1890 was over 10,200,000. This would mean a total increase of 16.2 per cent in ten years, or 15.2 per thousand per year, and, consequently, a total birth-rate of 32.6 per thousand. This would permit us to affirm with safety that the American birth-rate is between 32.1 and 32.6 per thousand.

There is, moreover, another element to be taken into consideration, namely — the number of departures from the country during the decade. This, of course, means a still higher birth-rate. But it is certain that the emigration movement is very light. In 1900 there were in the United States 7,732,103 foreigners who had been resident for more than ten years, and who consequently represented the residue of the 9,249,560 foreigners enumerated in 1890. This section of the population had thus under-

gone a decrease of 1,479,930 units, or 16 per cent, in ten years, almost, in fact, what it would have lost by death if its death-rate had equaled that of the population as a whole — which is in accordance with the facts observed. In the case of the native Americans, too, emigration is extremely feeble. An exodus of from 300,000 to 350,000 of the residents of 1899, would raise by one-half per thousand the natural increase, and the birth-rate correspondingly. But it does not appear that even this degree of movement has been attained. Altogether, increasing our figures a trifle in order to approach the truth with all possible exactness, the birth-rate of the American people may be placed at between 32 and 33 per thousand.

This is a respectable rate. It is lower than that of Russia, Germany, Austro-Hungary and Italy, to be sure, but equal to that of Holland and higher than that of Great Britain, the Scandinavian countries, Belgium, Switzerland, and — it unfortunately goes without saying — France, which from 1890 to 1900 had scarcely twenty-three births for every thousand inhabitants.

Let us now proceed to ascertain if possible the birth-rate of the constituent elements of the American population. There is one element that may be studied with ease, for it increases by little more than the excess of births over deaths. This is the negro element. In 1890 there were in the United States 7,488,788 negroes, in 1900 there were 8,840,789, an increase of 1,352,000, or of 135,200 per year for an average population of 8,165,000. This means an annual average increase of about 16.5 per thousand. If, as in the case of the whites, the death-rate of the blacks were about 17.4 per thousand, their birth-rate would be 33.9 per thousand, and consequently higher by 1 or 2 per thousand than the birth-rate of the whites. But the death rate of the blacks, a people less civilized than the whites, is certainly higher

than that of the latter. For various reasons we are led to the conclusion that it is not less than 20 per thousand, and that it may be even above that figure.[1] From this it follows that the birth-rate of the colored population is at least 36.5 per thousand.

The birth-rate of the foreign element in the population may also be calculated with ease. The number of children aged less than ten years and born in the United States of foreign parents was 4,719,716 on June 1, 1900. But, according to the statistics of the census, out of every 100 persons described as "born in the United States of foreign parentage," only 68 have both parents foreign, the remaining 32 having one or the other parent native. Supposing that this proportion holds for the children under ten — which seems altogether likely — we should have 3,200,000 children of foreign parentage on both sides and 1,500,000 of foreign parentage on only one side. It is apparent that, in order to obtain a correct idea of the contribution of the foreign element to the natural increase of the population, we must add to the

[1] According to the official statistics of those localities where registers are kept the 1900 death-rate of the whites was 17.3 per 1,000 and that of the negroes 30.2 per 1,000. But the territory covered by registration had a negro population of only 1,180,000 (or less than one-seventh of the total negro population of the United States) as against a white population of 27,555,000. Moreover, with the exception of nine Northern states, registration affected only towns and cities, and, as is well known, the death-rate of the urban negro is much higher than that of his rural brother. It is further to be observed that so far as concerns the nine states (New York, New Jersey, Massachusetts, Connecticut, Rhode Island, new Hampshire, Vermont, Maine and Michigan) where registration affects town and country alike, the negro population is very small. All in all, therefore, the registration statistics hardly warrant any statement more definite than that the death-rate of the negroes is unquestionably higher than that of the whites. It would seem, nevertheless, that we may obtain more satisfactory information by adopting another method of calculation. The total number of deaths listed in the census of 1900 was 1,039,094, which gives a general death-rate of 13.6 per 1,000. Comparing these figures with those furnished by the official registers, the conclusion is inevitable that the general death-rate, in 1900, was really 16.3 per 1,000 (17.4 per 1,000 for the decade 1890–1900). This means that in order to obtain the true death-rate it is necessary to increase the census statistics death-rate by fully 20 per cent. Now, the negro death-rate in 1900, according to the census, was 16 per 1,000 on the basis of a total of 140,934 deaths. With the necessary 20 per cent increase, as above, the actual death-rate of the negroes appears to have been 19 per 1,000. Does this mean that their death-rate has decreased during the decade? In answering this question, it is well to remember that in all probability the census statistics err by omission much more in the case of the negroes than of the whites. Therefore the average rate of 20 per 1,000 given for the decade 1890–1900 may be well regarded as a minimum. Perhaps the rate is much higher, but exactly how much higher it is difficult to say.

former total one-half of the latter, which would give a grand total of 3,950,000. Still, this shows only the number of children born between 1890 and 1900 and alive in the latter year. Naturally a certain number were born and died during the intervening years. Let us, however, take this grand total of 3,950,000, or 395,000 per year, as the basis of our calculations. In 1890 the number of persons of foreign birth was 9,136,079, and in 1900 it amounted to 10,250,063. Striking the average, 9,743,-071, we see that at 395,000 births per year the birth-rate is 40 per thousand. High as this is it is below the actual rate, for, infant mortality being proverbially high, it is obvious that many more than 395,000 children must be born every year to give the total of 3,950,000 still surviving at the end of ten years. As I have said, there is after all nothing astonishing in this enormous birth-rate, the immigration movement bringing into the country large numbers of people from the most prolific countries in the world — Germany, Austro-Hungary, Russia, Canada and Italy.

The most interesting portion of our inquiry remains — the birth-rate of the native white element. In 1890 the total of native born (always excluding Alaska and Hawaii from our calculations) was 45,979,391, while in 1900 it was 56,595,379, an increase of 10,615,988. This excess, however, does not represent merely the natural increase of the native whites, for it includes the number of children born to parents of foreign extraction. Now, we have just seen that the number of such children aged less than ten years was, in 1900, 4,716,616. But, as we have also observed, 32 per cent of these, or 1,510,217, have foreign parentage on but one side, while 68 per cent, or 3,209,329 have foreign parantage on both sides. The latter total must be withdrawn from the total increase stated above, and we must also subtract the half of 1,510,287, or 755,143. Doing this, and thus eliminating

the part played by foreigners in the natural increase of the population of the United States, we obtain a net native increase of 6,651,516. This represents a gain of 14.4 per cent, or of 13.5 per thousand per year. Such, then, is the total excess of births over deaths among the native white element. On the hypothesis that their death-rate is the same as the rate prevailing for the country, or 17.4 per thousand, our calculations give us a birth-rate of 30.9 per thousand. As a matter of fact, the death-rate of the native whites is slightly lower than the general death-rate, so that it will be nearer the truth to place their birth-rate at from 30 to 30.5 per thousand.

This is almost exactly Great Britain's birth-rate for the same period. But it is markedly less than the birth-rate of all other countries from which the United States draws a strong immigrant contingent, with the exception of the Scandinavian countries. The inevitable conclusion is that the different elements of the white race found in the native population of the United States are less fecund in their new fatherland than they were in their old. And this despite the fact that the United States is a new country, with vaster opportunities for man than he could ever hope to obtain in the Old World, a country in which, it would seem, he should not hesitate to procreate. Generally speaking, too, it is a fact that a given human group, other things being equal, is more fecund in a new than in an old country. If this is not the case in the United States we have strong confirmation of the theory that a highly advanced civilization, and above all the democratic civilization of today, tends to reduce the birth-rate.

Ample proof of the correctness of this theory is disclosed by an examination of the variations of the birth-rate according to the different geographical divisions of the United States, so far as it is possible to make such an examination with the incomplete figures available. It appears that in the South Atlantic division the number

of native-born whites has increased, in the interval of the last two censuses, at the rate of 19.6 per cent — a rate far higher than the general average of 14.4 per cent. Now, we do not find a heavy immigration into this region from the other parts of the Union; on the contrary, there is an excess of emigration. Moreover, since the region is semi-tropical in character and a large proportion of its population backward, the death-rate of the whites is assuredly equal to if not higher than the death-rate of those whites who live further north. In proof of which need only be cited the statistics of towns and cities in which a fairly trustworthy registration is kept. It follows that the birth-rate of the Southern whites is much higher than the birth-rate of the Northern whites. Accepting, however, for lack of definite information, the general coefficient of 17.4 as their death-rate, their birth-rate will stand at 37 per thousand, in itself an extremely high figure.

The significance of all this lies in the fact that the Southern whites, the rude peasants of the mountains as well as the planters and "poor whites" of the plains, still preserve in large measure patriarchal customs. They lead a less strenuous life, they are much less modern than the men of the North, even than many a European people. Let us be frank — they are "backward." Many do not know how to read or write. In this region 11.4 per cent of the population is illiterate, as opposed to the 4.6 per cent for the country as a whole and the 1.6 per cent for the states of the North-East which, according to the official figures and according to other means of calculation, constitute that part of the Union in which the birth-rate is lowest.

The South Atlantic division, wherein outward or inward movements of population are relatively feeble, is the only one in which it is possible to place the growth of the native white population to the credit of the natural in-

crease of these whites. In all the other divisions there are great displacements of the native population itself; through immigration in the South Central and Western, emigration in the North Atlantic, different currents in the North Central. But the examination of the South Atlantic must suffice. I might add, however, that in certain states of the South Central division in which there is only a slight movement in the direction either of immigration or emigration — Alabama, Mississippi, Tennessee and Arkansas — the increase of the native white population in ten years is also higher than the general average of 14.4, being respectively 20.1, 17.7, 15.2 and 15.4 per cent.

If we scrutinize the variations of the birth-rate in point of time instead of place, we see that the rate for the United States is now much lower than it was at the beginning of the middle of the nineteenth century. During the decade 1820 to 1830, in which there were only 100,000 immigrants, the white population rose from 7,862,000 to 10,537,000, an increase of 34 per cent. In 1840, with gains through immigration since 1830 of only 599,000 units, it amounted to 14,195,000, an increase of 35 per cent. Subtracting the increase due to immigration, it is impossible to put the natural increase at less than 31 or 32 per cent from 1820 to 1830, and at 27 per cent from 1830 to 1840.

From 1880 to 1890, on the contrary, the white population passed only from 43,575,000 to 55,166,000 units, a round growth of 27 per cent, which includes, however, a heavy percentage due to immigration, no less than 5,246,000 immigrants having entered during the decade. In 1900 the white population totalled 66,990,000, a growth of only 21.5 per cent. There were less immigrants during this period, it is true (3,687,000), but if we deduct the gain due to them the increase falls to about 16 per cent. Assuredly there is a striking contrast be-

tween the showing of these decades and that of the decades 1820-1830 and 1830-1840. Indeed, it seems probable that if the decades 1880-1890 and 1890-1900 could be compared with any reasonable accuracy, the latter would show a slight diminution in the natural increase, and, as a consequence, in the birth-rate.

Thus, the fluctuations of the birth-rate of the American people bear out the inferences drawn from the variations shown by other nations. When we consider that the statistics show that for a quarter of a century there has been a steady decline in the number of births in the United States as a whole, and when we set against this the fact of the high birth-rate of the blacks, the Southern whites and the recently arrived European immigrants — natives, largely, of pretty primitive countries — we cannot fail to perceive that the democratic civilization of today is exerting a decided influence in the direction of diminishing the national birth-rate.

PART TWO

RURAL AMERICA

CHAPTER I

NATURAL CONDITIONS, OWNERSHIP AND OPERATION

In the opening pages of this work the leading characteristics of the geographical formation and of the climate of the United States were outlined. In regard to its soil it may be said that it is generally fertile between the Alleghanies and the one hundredth degree of longitude, which marks the boundary of the arid zone wherein there is insufficient rain. The basin of the Mississippi is covered with vast stretches of alluvia. On the Atlantic side the southern section contains a region of fertility in the plain which extends from the marshes bordering the sea to the Alleghanies. In the North Atlantic division, however, throughout New England and in portions of New York, a granitic, crystalline and less productive soil is found. This is also the case with the land bordering on Lake Superior. In the West beyond the arid zone, the plains through which the Columbia river flows in the state of Washington, and the valleys and hill districts of this state, of Oregon and of California, are extremely fertile.

Climate and soil have conjoined to make the Central divisions, from the Alleghanies to the one hundredth degree of longitude, the great cultural region. In the North Central division the principal products are hays and grains, the raising of live-stock being also an important agricultural industry. In the South Central, the semi-tropical and abundantly watered division, cotton is the principal product. Corn is also grown freely, and, as in the North Central, the live-stock industry is well

established. In some sections of the South Central tobacco is a staple product, and in others, in the extreme south, sugar-cane and rice are largely cultivated. On each side of this vast central territory agricultural regions, tho of less importance, are found. The North Atlantic division, which contains the great industrial centres, is given over to the production of milk, butter, cheese, poultry, vegetables, fruits — edibles so much in demand by large urban populations. In the South Atlantic division the leading products are cotton, tobacco, rice, oranges, lemons, bananas and pineapples. In the Western division the semi-arid zone is overrun by vast herds of cattle, which would be even more numerous did not the rigor of the climate restrict their development. Beyond the Rockies, on the Pacific Slope where the best climate in the world prevails, the soil is suitable for most varied products. Cereals, forages, and fruits are grown in abundance, the climate being exactly adapted to a number of fruits which it is impossible to grow in the Eastern, Central and South-Eastern divisions because of the extremely cold winters or the excessively humid summers.

Having thus obtained a general idea of the natural factors — the factors of soil and climate — determining the agricultural activity of the United States, let us now look at another factor that exercises a great influence on production — the partition of the land among the inhabitants. But, first, what portion of the soil has been appropriated, and what portion is under cultivation? The successive decennial censuses give us ample information on this subject by indicating, for every section of the Union, the size of the farms and by dividing the lands that compose those farms into two categories: improved land, in which the labor of man has intervened to direct production, and unimproved land, which remains in (or has returned to) its natural condition. The former comprises all land that is fit for cultivation; the latter, forests, waste lands, pastures,

and even hay fields — provided no care is taken of them beyond the mere mowing of the grass.

According to the census of 1900, the total farming area was 841,201,546 acres, of which 414,793,191 acres were improved. Thus the farming area formed a little more than 40 per cent of the total area of the United States (exclusive of the icy stretches of polar Alaska) and the improved area about 20 per cent. These may appear small percentages, but they will no longer so appear if one call to mind the fact that the first represents an area some six times, and the second an area some three times that of France. Nor will they appear insignificant if one remember how recently the colonization of the West was undertaken, and how vast are the arid regions about the Rockies. It is unnecessary to say that the proportion of land under cultivation varies extremely according to the different geographical divisions. The extent of variation is shown by the following table:

DISTRIBUTION OF AMERICAN FARMING LAND.

(IN MILLIONS OF ACRES.)

	Total area of division.	Total area of farms.	Total area improved land.	Total area unimproved land.
North Atlantic	105	65.4	38.9	26.5
South Atlantic	173.7	104.3	46.1	58.2
North Central	477.5	317.3	222.3	95
South Central	395	257.7	80	177.7
Western	760	93.8	27.2	66.6
Totals	1,911.2	838.5	414.5	424

To the total should be added a little more than 2,500,000 acres, including some 400,000 acres of improved land, for the farming lands of Alaska and Hawaii.

From this table it is evident that in each of the four divisions where climate and soil are suitable for agriculture, about 60 per cent of the total surface is in farms. In the Western division, on the other hand, division of

recent colonization and of arid lands, only a small fraction has been developed. It is in the two Central divisions that the highest proportions are to be found — and this altho, as has been shown above, the semi-arid zone involves the South Central division to no small extent. The explanation is simple. While it is true that these divisions are of later colonization than the Eastern ones, they possess, as regards the North Atlantic at least, a much more fertile soil, and, as regards both North Atlantic and South Atlantic, are much less wooded and may therefore be cleared more easily.

The North Central holds first place in point of improved land, nearly three-quarters of its farming country being in this condition. That such is the case is owing to the fact that this portion of the United States is devoted above all others to the production of cereals. Large numbers of cattle are also to be found, but it is to be noted that many of these are reared in a semi-intensive way, forage growths being carefully cultivated to sustain them during the rigors of the winter. In the South Central, on the contrary, and particularly in Texas, extensive livestock raising is the rule, the animals grazing all the year round on vast ranges. For this reason improved land is the exception and not the rule in these divisions.

The holdings of the South Atlantic division still show much wooded and waste land. In the North Atlantic, where the principal agricultural occupations are truck gardening (in the vicinity of large cities) and dairying, and where the production of cereals has almost altogether disappeared, there are many natural meadows on which cows are pastured. For this reason it is that unimproved land occupies a proportionally larger area than in the North Central. As will appear later, another factor operating in the same direction is the tendency shown in certain sections of the North Atlantic to allow land to return to

its primordial condition instead of continuing to submit it to cultivation.

Taking the United States as a whole, however, we find a considerable increase in the proportion of land under cultivation and we also find that this increase is proceeding with giant strides. The following table shows the farming area according to the last six censuses:

FARMING AREA OF THE UNITED STATES.

(In millions of acres.)

Year.	Total farming Area.	Total improved land.	Per cent of increase of total area.	Per cent of increase of total improved land.
1850.....	293.6	113	....	....
1860.....	407.2	163.1	38.7	44.3
1870.....	407.7	188.9	0.1	15.8
1880.....	536.1	284.7	31.5	50.7
1890.....	623.2	357.6	16.3	25.6
1900.....	841.2	414.8	35.0	16.0

There was, then, nearly three times as much farming country in 1900 as there was in 1850, the gain in point of improved land having been almost quadrupled — striking evidence of an immense effort at colonization. In every decade, except the last, the increase in improved land has been proportionately more rapid than the total increase, showing the energy with which the cultivators have worked their farms. And it must be said that if, from 1890 to 1900, the progress of cultivation proper seems to have slackened, it is only because colonization has reached the arid and semi-arid zones, in which are vast stretches of country suitable only for extensive live-stock raising. The ardor of the colonists has in no wise diminished; it is simply that the climate of the new regions wherein they have settled has obliged them to apply themselves to other than purely farming occupations. If the statistics relating to the state of the land do not suffice to show the results of their efforts we shall see these

results clearly enough when we come to study the development of the live-stock industry.

It should be remarked that the figures given above, and which are the official figures of different censuses, contain some apparent anomalies. They indicate, for example, that the area of farming country barely increased from 1860 to 1870. Here we see the consequences of the disastrous Civil War. But, however terrible its effects may have been in certain states, and altho they undoubtedly led to the abandonment of numerous plantations, it is none the less certain that the census exaggerates them. From all points of view the census of 1870 was palpably deficient in respect to the South, owing to the still troubled condition of that region. On the other hand, the census of 1880 gave a slightly excessive statement of the farming area by reason of misinterpretation of the questions to be asked by the enumerators. According to the rectifying calculations that have since been made it is estimated that the excess in the North Atlantic division alone was not far from 2,500,000 acres. It is more difficult to calculate the amount of error for the rest of the country, but it is not thought to attain such high proportions. Again, in 1900 were included in the category of "farms"— and justly — the great ranges belonging to the public domain but occupied by live-stock men who graze their herds thereon. For this reason the development of farming country from 1890 to 1900 seems a little more rapid than it really was.

Naturally, the Central and Western sections of the United States have had the lion's share in the agricultural extension of the past fifty years. The North Central division takes the lead with a five-fold increase in the extent of its farming country — from 62,686,490 acres in 1850 to 317,348,474 acres in 1900. The improved surface has developed even more rapidly — from 26,680,332 acres in 1850 to 229,314,099 acres in 1900. This

is almost a nine-fold gain. Most rapid progress was shown during the decades 1850–1860 and 1870–1880. During recent years there has been a slight diminution in the rate of increase, especially in respect to improved land — only 38,021,973 acres from 1890 to 1900 as against 48,449,807 acres during the preceding decade. The reason for this is that the best lands having already been occupied new colonists are largely obliged to settle in the more mediocre and insufficiently watered sections of the western portion which borders on, and is even partially included in, the semi-arid zone. The South Central division, which developed very rapidly in the middle of the nineteenth century — passing, during the years 1850–1860, from 77,645,460 to 118,992,965 acres of occupied land — suffered severely from the Civil War and its consequences. Up to 1880 it showed at most only 133,500,223 acres of farming country. Since then, however, there has been an extremely rapid gain, the acreage today being 250,000,000. There has not been a correspondingly rapid increase in improved land because colonization, even tho it has greatly extended the fertile cotton and corn fields, has of late years been more and more directed toward the westerly grazing grounds. In the West proper there were, in 1850, only 4,664,213 acres of farm land, of which but 347,845 acres were improved. The colonization of this region has been largely the work of the past twenty years.

In connection with this matter it is interesting to observe that in the course of the last ten years (1890–1900) the farming area has increased by more than 100,000,000 acres in the South Central division, as against 60,000,000 in the North Central and 45,000,000 in the West. Clearly the face of the colonizer is turned most persistently today towards the South Central division. However, it must not be forgotten that this is the division most strongly affected in 1900 by the statistical change

including as " farms " the ranches installed on the public domain. Moreover, in the North Central the improved land has increased by 38,000,000 as against 12,500,000 in the South Central and 3,750,000 in the West. Thus the North Central, the division bounded by the Great Lakes, the Ohio and the Mississippi, remains the region of colonization par excellence, while it would seem that it is chiefly the live-stock industry that has developed in the South Central and the West.

The divisions bordering on the Atlantic are quite differently situated from those beyond the Alleghanies. In the South Atlantic the farming country is so far from showing an increase over 1860 that it actually shows a decrease — 104,297,506 acres as against 106,520,771. We find, however, an increase in the area of cultivated surface properly so called, the area of improved land — 34,900,942 acres in 1860, 36,170,331 in 1880, 41,677,371 in 1890 and 46,100,226 in 1900. In the North Atlantic division, on the contrary, while the round total shows a slight increase — 65,409,089 acres in 1900 as against 61,081,545 in 1860 — there has been a noticeable decrease in the area of improved land since 1880. It was then represented by 46,385,632 acres, a total which must be reduced to a little less than 44,000,000 acres on account of the census error noted above. By 1890 there were but 42,338,024 acres of improved land, and by 1900 the area was still further reduced to 38,920,614 acres, or almost exactly the area of 1860. The decrease is especially perceptible in the industrial states of New England. In New York and Pennsylvania where the cities, large tho they be, occupy proportionately less space, a slight and extremely slow increase persists.

The old states of the East are encountering the same agricultural difficulties as Western Europe — the attraction exercised by the cities and, still more, the rivalry of the Western states. Being compelled to abandon almost

entirely the cultivation of cereals they have taken refuge in dairy production. But, for twenty years back, improvements in refrigerating processes have been making more and more serious inroads upon their one-time monopoly of supplying the large cities with dairy staples. Today their agriculture is more atrophied than ever. The single branch that is prospering is truck gardening in the immediate neighborhood of cities and towns. Unquestionably the Centre and the West hold absolute control of the agricultural future of the United States. Yet, from the statistics we have just been studying, it would seem that even in these most favored regions good land is becoming scarce and that cultivation proper has made less progress during the past ten years than during preceding decades.

The 841,201,546 acres — an expanse six times larger than France — are divided into 5,739,657 separate farms, which thus average a little more than 145 acres apiece. In France, according to the agricultural statistics of 1892, there are 5,702,000 farms — that is to say, almost exactly as many as there are in the United States — but their average size is only 20 acres. In Great Britain, according to the statistics of 1895, there are 520,000 farms of an average of 60 acres. Thus, in North America the farms are much larger than the farms of Western Europe, larger even than the farms of a country of such large holdings as England. In this there is nothing at all surprising, for the United States is a new country and a country of extensive cultivation. A farm which comprises 150 acres is, in our French eyes, a large holding, and we are entitled so to consider it, not only because a holding of 150 acres is very much above the average with us, but because it is very valuable — for it generally brings in an income higher than that of the average income of our countrymen and much more than suffices for the essential needs of the cultivator and his

family, in proof of which need only be cited the fact that the development of such a holding frequently means the employment of a number of day laborers. It is otherwise in the United States. There, 150 acres constitutes not a large but a small holding. Common sense would lead one to conjecture this, and the figures of the "Report" confirm the inference of common sense. The average value of the American farms is only a little more than $3,500 or about $25 an acre.

This is much less than the value of the average English farm if not than of the average French farm. In the total of $3,500, moreover, is comprised the value of the live-stock and of the agricultural machinery and implements. If this is subtracted the average value, including the value of the farm buildings, falls to less than $3,000, of which, according to the "Report," 21 per cent is represented by the buildings. This brings the average value per acre down to about $15. If, instead of considering the capital, we look at the products, we find that out of nearly 6,000,000 farms there were only 1,000,000 whose products in 1899 exceeded in gross value the sum of $1,000, and only 154,000 farms whose products were worth more than $2,500. The United States then, is not, as a general thing, a country of large holdings but of small and average holdings.

Do these holdings tend to further partition or to concentration of ownership? How do they vary according to the different divisions of the country? The following table is of assistance in obtaining answers to these questions:

AVERAGE SIZE OF FARMS (IN ACRES).

Division.	1850.	1880.	1890.	1900.
North Atlantic	112.6	97.7	95.3	96.5
South Atlantic	376.4	157.4	133.6	108.4
North Central	143.3	121.9	133.4	144.5
South Central	291.0	150.6	144.0	155.4
Western	694.9	312.9	324.1	386.1
The United States	202.6	133.7	136.5	146.6

From 1850 to 1880, there was a constant and universal movement in the direction of the diminution of the average size of the farms of the United States. Since then an exactly opposite movement has appreciably manifested itself. Is it necessary to conclude from this that the small farmers, or at least the small farms, are passing away? Let us examine the matter closely. The decrease in the size of the farms has been especially marked in the South where, since the Civil War and the abolition of slavery, the cultivation of cotton, the principal staple, has undergone a complete change. Formerly produced almost exclusively on vast plantations by the aid of slave labor, the great American textile is as a rule cultivated today by small negro share tenants among whom the planters have parceled out their domains, it having been recognized that this was the best way to utilize free negro labor. The same course, to a greater or less degree, has been adopted in the case of other products. So the South Atlantic division, which was formerly the division of large holdings, was in 1900 of all the divisions of the United States, with the exception of the North Atlantic, that in which the farming country was most cut up into small holdings.

In the South Central division a similar movement was seen up to 1890, but in the course of the last ten years the tendency has been the other way. It would be a mistake, however, to imagine that this indicates concentration of ownership. In fact, in all those states of the Central South where the population is dense and the greater part of the soil already under cultivation, especially in those states which are east of the Mississippi and even in Arkansas and Louisiana west of the river, we find that the average size continues to decrease very noticeably. Its increase, when the division is viewed in the ensemble, is due solely to the fact that an extremely large number of new farms is to be credited to Texas,

Oklahoma and Indian Territory, sections situated beyond the confines of colonization and hence given over to ultra-extensive cultivation. Moreover, these new farms are partly located in the vicinity of, if not actually within, the semi-arid zone, and a large number of them are devoted to live-stock raising, an industry that requires much space. This explains why the 320,000 Texas farms of 1900 averaged 350 acres as against an average of only 225 acres for the 228,000 farms of 1890.

In the northern sections of the United States the holdings have never been so vast as in the southern, and hence they have not undergone a similar division. Even in the North Central — which has long been the principal region of colonization — the average size, which has been steadily rising since 1880, is today as great as it was in 1850. The remark just made about the states of the Central South is equally applicable here, and has been even longer applicable. The tendency to division in sections already colonized is always offset, to a certain extent, by the development of new farms further west devoted to operations which require ample territory for their most profitable prosecution. When colonization has penetrated to less fertile zones, to the semi-arid or the arid, or when capital is required to meet heavy initial expenses of clearing the ground, recourse is had to more and more extensive cultivation. Thus the new farms become larger and larger. This increase has completely hidden, in the statistical total, the tendency to division which persists elsewhere.

If, indeed, we compare the figures of the three censuses of 1880, 1890 and 1900 for the different states of the North Central division, we find that the average size has decreased in Ohio and Indiana, that in Illinois and Michigan the size remains almost stationary, with light oscillations either way, and that the only state east of the Mississippi presenting an appreciable increase is Wis-

consin. Even here the increase is not at all large — 117 acres in 1900 as against 114.7 in 1890. This would seem to indicate that, the best land having been already occupied, colonization has been compelled to make its way to the more mediocre and more difficult soil in the northwest of the state. West of the Mississippi a decrease is also observable in Missouri, but an increase everywhere else. Modest enough in Iowa and Kansas, it becomes large in the two Dakotas, in Kansas and in Nebraska, which to no small degree extend into the semi-arid zone. It may perhaps be said that in these two last-named states, whose population remained almost stationary from 1890 to 1900, there has been not only an increase in the size of the newly-created farms but a real concentration of ownership through the disappearance of small holdings. During a recent visit to the United States I frequently heard it stated that in these parts of the country the cultivation of cereals had been pushed too far to the west. It appears certain that many farms devoted to these products have had to be abandoned.

The reasons noted above may also be adduced to explain the great increase in the average size of the farms of the Western division. All the states of this division, except the three bathed by the Pacific, are located in the semi-arid or the arid zone. Even the three Pacific states themselves have a large part of their territory in these zones. Except in the case of California colonization of the West had barely begun by 1880 and was confined to the best lands. By 1890, however, it had entered the semi-arid zone somewhat largely and has since pressed into the arid. Everywhere, save in California, the holdings have increased in size— not by a great deal, it is true, in the case of Washington and Oregon (where the predominance of agriculture proper has had a repressive effect in this respect), but in much higher proportion for the other states of this division.

To sum up. In every part of the United States west of the Alleghanies a double phenomenon is observable: on the one hand, a persistent tendency, altho perhaps less marked than formerly, to a decrease in the size of farms in regions that have long been colonized; on the other, the creation of large farms on mediocre or insufficiently watered lands, useful only for very extensive cultivation or the raising of live-stock. East of the Mississippi the size of the average farm is, in every state, less than 125 acres; west of the river it is everywhere much larger, except in Missouri, Arkansas and Louisiana.

The North Atlantic division, of which something has yet to be said, shows some peculiar characteristics. There the average size diminished from 1850 to 1880, but it has increased since 1890 and even since 1880, if one take into account the slight corrections that must be made in the statistics relating to that year. It is beyond doubt that actual concentration of ownership is in progress. The increase in the size of the average holding is not due to the fact that new and large farms have been established in hitherto uncolonized districts; so far from that, the number of farms has in reality diminished, during the decade 1890–1900, in all the states except New Jersey and Pennsylvania, the latter having still some agricultural importance. In a few of the states the numerical decrease is really very large. If the size increases it is because cultivation in the strict meaning of the term is of less and less moment in New England and New York, where it is being replaced by dairy production on larger farms covered with pastures and meadows. The case is similar to that of European England — grazing is being substituted for husbandry. The increase would appear even larger were it not masked by the development of market gardening about the cities and towns.

Let us examine now the variations in the average value of the farms of the United States according to regions

and epochs. The following table will be of assistance in this respect. Bear in mind that the figures relate to the total value — to the value of the live-stock and agricultural machinery as well as of the land and buildings.

AVERAGE VALUE OF AMERICAN FARMS (IN DOLLARS).

Division.	1850.	1880.	1890.	1900.
North Atlantic	3,440	4,592	4,510	4,355
South Atlantic	2,846	1,634	1,779	1,511
North Central	2,090	3,597	4,427	5,238
South Central	2,418	1,455	1,740	1,698
Western	2,444	6,358	9,396	7,059
The United States	2,738	3,038	3,523	3,574

Looking at the United States as a whole, it was in 1860 that the average value of the farms attained the maximum — $3,904. At that time the great plantations of the South had not yet been cut up and their plus-value from 1850 to 1860 had been enormous. In the North Atlantic division the maximum ($4,899) was reached in 1870. In the North Central the value has steadily increased, the size of the farms varying little, but the land naturally taking a greater plus-value in proportion as the population became more dense and as the colonization of more distant and less fertile regions increased the ground rent. In the West the same phenomenon was in evidence until 1890, but the lands that have since been thrown open to colonization are of so mediocre a quality that the average value has been reduced despite the surface increase.

I give below the average value per acre of the farms of the United States, by region and by epoch, it being always understood that the figures refer not merely to the value of the land (which on the average accounts for two-thirds) but also to the proportional value of the buildings, machinery and live-stock.

AVERAGE VALUE OF FARMS PER ACRE (IN DOLLARS).

Division.	1850.	1880.	1890.	1900.
North Atlantic	30.54	47.02	47.34	45.11
South Atlantic	7.56	10.38	13.31	13.94
North Central	14.59	29.51	33.20	36.25
South Central	8.31	9.67	12.08	10.93
Western	3.52	20.32	28.99	18.28
The United States	13.51	22.72	25.81	24.39

It is easy to see how powerful an influence has been exerted on the acreage value by the creation between 1890 and 1900 of great grazing fields in the semi-arid zone — an influence that has made itself especially felt in the Western and South Central divisions. It is in the North Central division that the farms of extensive cultivation have the highest value. In the North Atlantic the average is raised by the market gardens. In the West the fruit cultures of California have a similar effect. Without them, indeed, the acreage value would be much less.

The size of the farms is only one phase of the constitution of rural America. There is another, and one no less essential — the tenure of the soil. In France, as we know, cultivation is most frequently in the hands of the owner himself; in England, in the hands of cash tenants. How is the United States situated in this respect? The information which the "Report" gives us on this point is very precise and detailed. Cultivators are classified under six different headings: Owners; part owners (those who own a portion of the farm tilled by them and rent the remainder); owners and tenants (cultivators of farms which are operated partly by the owner and partly by one or more individuals who receive a portion of the products as their remuneration); managers (operating for non-resident owners or for public institutions or corporations); cash tenants, and share tenants. First, let us see how the farms of the United

States are operated according to geographical distribution.

PER CENT OF THE NUMBER OF FARMS ACCORDING TO FORM OF TENURE.

Regions.	Owners.	Part owners.	Owners and tenants.	Managers.	Cash tenants.	Share tenants.
North Atlantic.....	72.3	4.0	0.9	2.0	9.8	11.0
South Atlantic.....	49.3	4.9	0.6	0.9	18.0	26.3
North Central.....	57.8	12.1	1.2	0.9	9.5	18.4
South Central.....	44.8	5.2	0.8	0.6	17.3	31.3
Western	69.6	10.1	0.6	3.1	7.7	8.9
The United States.....	54.9	7.9	0.9	1.0	13.1	22.2

This indicates, clearly enough, that the majority of farms are operated by their owners. It is worth while adding that the " part owners," who are especially numerous in the Centre and the West, generally own the larger portion of the lands they work, and that the portion owned by them is, on the average, as extensive as are the farms of the owners of the same region who content themselves with cultivating their own property. In fact, in order to show the share of direct ownership in the cultivation of the arable land of the United States it is necessary to add together the first three classes (owners, part owners, and owners and tenants). That, moreover, is what was done in previous censuses. We thus obtain a round proportion of 63.7 per cent, which clearly establishes the fact that by far the greater number of the farms of the United States, or at least of the small and average farms, are tilled by their owners.

This is especially the case in regard to the North and the West. In the West, however, as in the North Atlantic division, a number of holdings are operated by managers on a fixed salary. North Atlantic holdings of this character are in many cases the country homes of wealthy men who live in cities the greater part of the year. The

Western holdings thus operated are principally sheep and cattle ranches belonging to corporations.

Direct ownership plays a smaller role in the South than in any other section of the country. Cash tenancy and, still more, share tenancy, hold a very important place there. While the abolition of slavery gave the negroes freedom it did not give them land. Lacking in the spirit of self-initiative few of them have become colonizers of the West. Many are disinclined to work, or at least to work other than spasmodically, and their employment as day laborers has proved disappointing. The result is that the soil of the old plantations has been partitioned among them, either as cash tenants or as share tenants, and the system of share tenancy has carried the day over that of cash tenancy because the majority of the negroes have neither enough capital nor enough of the spirit of order and economy to make good cash tenants.

The holdings thus operated are, in general, of small size. Eight per cent of the cash tenants and 3.7 per cent of the share tenants cultivate farms of less than 10 acres; 10.8 per cent of the former and 11.5 per cent of the latter, farms of from 10 to 20 acres; 30.9 per cent of the former and 32 per cent of the latter, farms of from 20 to 50 acres. Thus 49.7 per cent of the farms worked by cash tenants and 47.2 per cent of those in the hands of share tenants (or almost exactly half of all the farms operated by tenants) are less than 50 acres in size, while the size of the average American farm is nearly 150 acres. Nearly 30 per cent of both the cash and the share tenants operate farms of from 50 to 100 acres, and 18.2 per cent of the former and 19.9 per cent of the latter are found on farms of from 100 to 175 acres. There remains only 10 per cent of both classes for farms of a larger size than 175 acres. This is very different from the situation prevailing in France, where the farms of cash tenants, if not

those of share tenants, are, as a general thing, larger than the holdings operated by direct ownership.

According to the table published herewith it would seem that tenancies are becoming of increasing importance in the agricultural life of the United States:

DISTRIBUTION OF THE FARMS IN 1880, 1890 AND 1900, ACCORDING TO FORM OF TENURE.

				Per cent of farms operated by		
	Owners.	Cash tenants.	Share tenants.	Owners.	Cash tenants.	Share tenants.
1880.....	2,984,306	322,357	702,244	74.5	8.	17.5
1890.....	3,269,728	454.659	840,254	71.6	10.	18.4
1900.....	3,713,371	752,920	1,273,366	64.7	13.1	22.2

The tendency to increasing operation by cash or share tenancies is especially accentuated in the South, where it keeps pace with the custom of partitioning the plantations for the reasons already noticed. It is also seen in other sections, and has caused anxiety in certain quarters where it is held to betoken conditions unfavorable in a democracy. But the "Report" does not believe that there is reason for uneasiness. The cash and share tenants, it declares, do not multiply through unsuccessful owners. Not only are there more and more owners all the time, but the proportion of farms operated by direct ownership remains constant, if it does not show an increase. This appears a decisive argument. If the number of cash and share tenants also increases it can only be through recruits from the ranks of the farm laborers, and this is obviously a cause for nothing but self-congratulation.

All in all, it would seem that the agriculturists of the United States are happily situated. They form a vast

rural democracy, cultivating, with a remarkably progressive spirit, the soil which they possess.

The manner in which the land under cultivation is divided into farms may be still better seen from the following table:

DISTRIBUTION OF FARMS ACCORDING TO SIZE.

	Number.	Per cent of whole.	Area of total.	Area improved.	Average value per farm. (In dollars.)
			(In thousands of acres.)		
Under 3 acres.....	41,882	0.7	79,5	69,6	2,135
3 and under 10 acres..	226,564	4.0	1,402,4	1,266,7	1,105
10 and under 20 acres..	407,012	7.1	5,708,5	5,112,0	1,055
20 and under 50 acres..	1,257,785	21.9	41,544,6	33,006,4	1,280
50 and under 100 acres..	1,366,167	23.8	98,600,2	67,348,4	2,499
100 and under 175 acres..	1,422,328	24.8	192,688,1	118,393,6	4,023
175 and under 200 acres..	490,104	8.5	103,289,5	63,203,1	6,311
200 and under 500 acres..	377,992	6.6	129,686,2	72,331,5	8,298
500 and under 1000 acres..	102,547	1.8	67,878,3	29,478,0	11,718
1000 acres and upward...	47,276	0.8	200,324,0	24,583,8	33,156

These figures show, first of all, that the largest number of farms are included in the middle division — from 20 to 175 acres. The large farms (in this land of extensive cultivation one calls "large" only such farms as contain more than 250 acres) form only 9.2 per cent of the whole. It is true that they occupy nearly half of the total farming surface. But they contain less than a third of the total of improved land. The proportion of the improved to the total surface will repay study. From nine-tenths for the farms below 10 acres, it falls to four-fifths for those of from 10 to 50 acres, to a little more than two-thirds for those of from 50 to 100 acres, and to three-fifths for those of from 100 to 260 acres. For farms of from 260 to 500 acres it is still above one-half, but for those of more than 1,000 acres it does not comprise

more than one-eighth of the total area. Curiously enough the farms of less than 3 acres average in value more than those of from 3 to 50 acres. This is because the former are chiefly market gardens or orchards located near cities and towns. It is not until we reach farms of more than 260 acres that we obtain an average value of more than $8,000, a sum which, of course, includes the value of the land, the buildings, the live-stock and the machinery. All of which goes to prove that the land of the United States is, as a general thing, in the hands not of wealthy capitalists, but of a numerous rural democracy.

If we examine the classification of the farms by size in the different divisions we shall be led to the conclusion to which we have already been brought through studying the average size in each of these divisions — we shall see that, as a rule, farms increase in size the farther west they are located. Comparison of the figures of the successive censuses shows that small farms, that is farms below 20 acres in extent, form today a much higher proportion of the total than they did twenty years ago. The same holds of farms of from 20 to 50 acres, save in the North Atlantic division, whence the small farmers, with the exception of the market gardeners and florists, have emigrated, and in the North Central division, where the extension of colonization into the semi-arid zone has increased the number of large farms. Farms of from 50 to 100 acres are, on the contrary, proportionately less numerous than formerly, especially in the South. It must be said, however, that those of from 500 to 1,000 acres have increased in the North Central division, and that very large farms, that is farms of more than 1,000 acres, show an even more marked increase in the Western, the North Central and the North Atlantic divisions, for the reasons mentioned above. On the other hand, after what has already been said, it need scarcely be added

that very large farms have diminished in the Southern divisions.

I cannot better sum up the distribution of holdings than by quoting from the "Report," which says: "Nearly one-half of the counties in which the average farm area was less than 80 acres were situated in the territory embracing the rich alluvial deposits of the lower Mississippi River and its tributaries. They were counties engaged largely in the cultivation of cotton. . . . The counties with average farm areas ranging from 80 to 160 acres cover the greater portion of the states east of the Mississippi River. . . . To the west of the area covered by these farms is found a more or less well-defined strip of country with average areas ranging from 160 to 320 acres, and west of that, a region with farms containing from 320 to 640 acres. . . . In the far West the counties with farms of the smallest average size were those where irrigation is being extensively practiced."

Should one wish to utilize the statistics relating to the extent of the holdings for the purpose of comparing rural America with rural Europe it must be kept constantly in mind that the value of the "acre" unit, measured by the value of the product that this unit annually furnishes, is much less there than on this side of the Atlantic. That is why I have given, in addition to the statement of the number of farms of every classified size, their average value. It is unquestionable that a farm of from 100 to 175 acres, which in France constitutes a large holding, is a small holding in America, from the social standpoint, since its value attains, on the average, only a little more than $4,000.

But that which shows most clearly the character of the farms of the United States is their distribution according to the value of their product.

DISTRIBUTION OF FARMS ACCORDING TO THE VALUE OF THE PRODUCT IN 1899.[1]

	Number.	Per cent of whole.	Total value of product (In millions of dollars.)
Less than 1 dollar[2]	53,406	0.9	.....
From 1 to 50 dollars	167,569	2.9	4.9
From 50 to 100 dollars	305,590	5.3	22.2
From 100 to 250 dollars	1,247,731	21.8	219.8
From 250 to 500 dollars	1,602,854	27.9	584.0
From 500 to 1,000 dollars	1,378,944	24.0	965.0
From 1,000 to 2,500 dollars	829,443	14.5	1,203.3
More than 2,500 dollars	154,120	2.7	765.0
Total	5,739,657	100.0	3,764.2

Thus, less than one-fifth of all the farms in the country yield a product worth more than $1,000, which, to put it mildly, is not a considerable sum; and an exceedingly small proportion, less than 3 per cent, in fact, a product worth more than $2,500, a sum which is itself far from representing any great wealth on the part of the cultivator.

In the North Central, the principal agricultural region of the United States, the most numerous type of farm is that which yields a product worth from $500 to $1,000. Comparing this with the results obtained by analysis of the tables of distribution according to area and leading culture, the "Report" concludes that the farm-type of the North Central division is a farm of from 175 to 250 acres, given over chiefly to the production of hay and grain and bringing in an income of from $500 to $1,000. In the North Atlantic division the type is a farm of from 50 to 100 acres, employed in intensive live-stock raising and dairy production, and also bringing in from $500 to $1,000. In the two Southern divisions the type is again a farm of from 50 to 100 acres, but

[1] Exclusive of the value of products fed to livestock.
[2] This refers to farms which have not yet been developed, usually because they have just been opened up; and to farms rendered profitless by the caprices of nature.

producing chiefly cotton and affording an income of only $250 to $500, a return corresponding to the meagreness of the needs of the small cash tenants and the colored share tenants. In the Western division the general characteristics are not dissimilar to those of the North Central, but there is observable a higher proportion of vast holdings given over to extensive live-stock raising and frequently operated in the interests of corporations.

We have just been examining the return received by the American farmer for his toil. What now, are his expenses? The first, and the most important, is the cost of labor. This, however, appears insignificant compared with European figures. According to the census statistics it does not amount to more than $365,000,000 for the whole agricultural region of the United States, or an average of $64 per farm and 43 cents per acre. This represents only 9.7 per cent of the value of the product. In the North Atlantic division, where cultivation is most intensive, the cost of labor runs up to $105 per farm, $1.09 per acre, and 14.4 per cent of the value of the product. In the West, where the numerous large holdings call for the employment of a vast army of help, the cost of labor reaches $232 per farm, but only 60 cents per acre. This, however, is the equivalent of 19.5 per cent of the value of the product. Finally, in the South, where the farms — for the cotton region at any rate — are pretty well limited to the area the operator and his family can cultivate without outside assistance, the cost of labor falls to $39 per farm and 36 cents per acre for the Atlantic states, and to $30 per farm and 19 cents per acre for the Central states, representing, respectively, 9.2 and 6.5 per cent of the value of the product.

In the main, as is only natural, the large farms incur heavier expenses for labor than do the small ones. This is not the case, however, with the very small farms of an area below 20 acres and consisting largely of nurseries,

market gardens and orchards. For farms of less than 3 acres the cost of labor averages $77 per farm and $40.30 per acre. It falls to $2.95 per acre for those of from 3 to 10 acres, and to $1.12 per acre for those of from 10 to 20 acres. For the great body of farms of from 20 to 1,000 acres, it averages between 45 and 55 cents per acre, while for the very large farms, farms of more than 1,000 acres, it falls to 25 cents per acre. According to the principal source of revenue, the cost of labor varies from 29 cents per acre for live-stock farms and 30 cents for cotton farms, to 57 cents for tobacco plantations and 86 cents for dairy farms. Rice, sugar, vegetables and fruits demand more care and the cost of labor for farms raising these runs even higher than the figures last quoted. In floral establishments it even amounts to $97.42 per acre.

Nevertheless, it is apparent that for the great majority of American farms the cost of labor is very light. This serves to emphasize the fact that a vast number of farms are cultivated by the occupant without other aid than that afforded by members of his own family. That such is the case may be readily shown otherwise. The number of males aged more than ten years and deriving their living from agricultural pursuits, according to the statistics of the last census, is 9,349,322. The number of farms is 5,739,657. The number of overseers must be at least equal to the number of farms. This means that there are not more than 3,609,665 domestics or day laborers engaged in agriculture. As many of the large farms give employment to a number of men, it follows that the majority of farms must be operated without hired help. It is to be said, of course, that some farms are directed by women. This would slightly raise the proportion of laborers to overseers, but only slightly, for farms operated by women must be exceedingly rare.

Again, a large proportion of the laboring class is com-

posed of members of the cultivators' families. If we consider not the males alone, but the people of both sexes occupied in agriculture, we obtain a total of 10,438,188. It may be remarked, in passing, that this indicates that only a little more than 1,000,000 women work on the farms of America. On the other hand, in the United States, as in the majority of countries, the wives and very often the daughters, of a farmer are officially classed as "without profession," altho they contribute material aid to farming operations. Generally speaking, only those women who find employment away from home are described as being occupied in agriculture. However, of these 10,438,188 individuals, 5,681,324 are classed as "farmers, planters and overseers," a figure almost exactly corresponding to the total number of farms (there is nothing surprising in slight discrepancies in such large figures); and 4,459,396 as "agricultural laborers." Of this last total 2,366,313 (1,925,247 men and 441,066 women) are members of the families of farmers. There remain only 2,047,658 day laborers, or "hired men," properly so called. To this total may be added some 300,000 persons of special employment — gardeners, etc.— swelling the total to about 2,350,000, which still constitutes an extremely small proportion of the grand total of 10,500,000 people gaining a livelihood in agriculture.

If the cost of labor is light in the United States, still lighter is another item which often bears heavily on the cultivators of Europe — the cost of fertilizers. For the year preceding the last census, these cost the farmers throughout the country a total of only $54,783,757. Ten years earlier the cost was still lower — $38,500,000 — and twenty years ago lower again, having been $28,500,000. It is evident that this expense has increased a little more quickly than has the area under cultivation. On the other hand, it is equally evident that fer-

tilizers are still of small importance in the agricultural economy, a fact which confirms the statement that the United States is as yet a country of extensive cultivation. It appears that the general average expenditure for this auxiliary does not amount to more than $10 per farm and 7 cents per acre, or 1.2 per cent of the value of the product. Naturally, it is highest in the Atlantic divisions, where agriculture has been practiced longer and more persistently than elsewhere, and where the soil, never very fertile, has lost much of its original fecundity. Here the cost of fertilizers reaches an average of $23 and $24 per farm, and 24 and 22 cents per acre, for the North and South Atlantic divisions respectively. In the North Central division the figures are $3 per farm and 2 cents per acre; in the South Central, $4 per farm and 3 cents per acre; in the Western, $4 per farm and 1 cent per acre. The general average is raised by the market and fruit farms. For the large scale cultures, it is very low: for hay and grain, 4 cents per acre; for live-stock, 2 cents; for dairy produce, 9 cents; for cotton, 14 cents, and for tobacco, 30 cents. I might add that the majority of farms, at least in the North and West, where they are devoted principally to hay and grain production and to the live-stock industry, use no other fertilizer than the farm manure.

The fact that the cost of production is so low, whereas it is so heavy in Europe, is evidently one of the great causes of the superiority of American agriculture over the agriculture of the Old World. But why is the cost of production so low? In regard to fertilizers, the natural fecundity of the soil furnishes an obvious answer. Here the Old World, unfortunately, cannot take lessons from the New. It is different when we consider the cost of labor. The cheapness of this is due to splendid organization, to the use of large numbers of domestic animals, and to the employment of the most improved agricultural

machinery. In France we often hear the complaint that agriculture "lacks arms"— to use the customary phrase. It lacks them in the United States also, if one contemplate the enormous area under cultivation and the colossal aggregate of products. But it makes better use of them. It has learned how to economize in them by replacing human strength with the strength of animals and machinery, so far as this is possible to be done. In agriculture, and as we shall see in industry also, man is employed in directing, not in providing, power. Utilized thus scientifically, human labor becomes extremely productive.

The "Report" makes a rather interesting calculation in order to estimate the share of labor in the gross agricultural revenue — to find what it terms the "labor income." The total value of products (exclusive of the value of products fed to live-stock) amounted in 1899, it says, to $3,742,129,000, and the increase in the value of the farms to $445,763,000 — the tenth of the total increase in value from 1890 to 1900. These sums combined give a total of $4,187,892,000, representing the gross agricultural return. Deducting for interest at 6 per cent on the value of the farm property the sum of $1,226,394,000, the remainder — $2,961,498,000 — is held to represent the "labor income." This means a return of $288 to each of the 10,500,000 persons occupied in agriculture. As a matter of fact this total per head must be greatly reduced, for, as I have said, many women not classed as being occupied in agriculture actually share in the distribution.

The value of the farm machinery and implements averaged, in 1900, $133 per farm. All things considered, this is quite high. In the North Atlantic division, however, the average value was as high as $226; in the Western division, $218, and in the North Central division, $166. The South Central and South Atlantic divisions showed

an average value of only $76 and $55 respectively. The general average value per acre was 90 cents. In connection with this subject some observations contained in the "Report" may be cited to advantage. "Much has been written," it says, "of the importance of farm machinery in the economics of agriculture, but the fact is too often overlooked that the machinery is valueless unless driven by some power other than human muscle. The power of steam and of falling water applied through the agency of the steam engine and the water wheel gives great effectiveness to labor in factories. The corresponding power of the farm at the present time is principally that of the horse and mule. . . . It is largely the use of the horse and the mule that enables the farmer of this country to make his labor more effective than that of the average agricultural worker in Europe and Asia."

In fact, there are in the United States, exclusive of the horses used in cities and towns, 18,280,000 horses and more than 3,000,000 mules. Inclusive of everything, there are only 4,184,000 horses in Germany, 2,903,000 in France, and 2,000,000 in the British Isles. The agricultural supremacy of the United States has been won through the combined use of machinery and domestic animals to turn into wealth the fertility of a virgin soil.

CHAPTER II

THE VALUE AND DISTRIBUTION OF VARIOUS PRODUCTS

Equal in area to three-fourths of Europe, the vast territory of the United States is admirably adapted by nature to the cultivation of a great variety of agricultural products. It is to be observed, nevertheless, that the conditions of soil and climate are, for a given space, much less diversified in America than in our part of the world, and that the climatic extremes shown everywhere, except in a narrow strip of country on the Pacific Slope, are not at all suitable for certain delicate products. As a matter of fact, there are only four highly important branches of American agriculture. Three of these are alimentary, the other is industrial. They are: the cultivation of hay and grain, the raising of live-stock, the production of milk and its derivatives, and the growth of cotton. As secondary cultures, but still of importance, may be added the cultivation of fruits, vegetables and tobacco.

A classification of farms according to their chief sources of revenue — that is to say, their principal products — makes the primacy of the products just mentioned very evident.

Numerically as well as in area and value, hay and grain and live-stock farms are far in the lead. Then come dairy and cotton farms, and vegetable, fruit and tobacco farms. The sugar farms, which are few in number and small in area, have a relatively high value, but only because industrial establishments are operated in connection with them. Sugar farms properly so called are really of small importance.

NUMBER AND AREA OF FARMS ACCORDING TO THEIR CHIEF SOURCES OF INCOME.

	Number.	Area (In millions of acres). Total.	Improved.	Round value in millions of dollars.
Hay and grain	1,319,856	210	146	6,380
Vegetables	155,898	10	5	547
Fruits	82,176	6	3	440
Live-stock	1,564,714	355	134	7,505
Dairy produce	357,578	43	22	1,693
Tobacco	106,272	9	5	215
Cotton	1,071,545	89	45	1,107
Rice	5,717	1	0,4	18
Sugar	7,344	2	1	150
Flowers	6,159	0,04	0,03	52
Nursery products	2,029	0,1	0,1	19
Miscellaneous	1,060,369	111	48	2,384

It need hardly be said that the relative proportion of different classes varies with geographical divisions, and their distribution is well worth study because it gives an excellent idea of the products in every part of the Union. More than half the hay and grain farms — to be exact, 797,000 out of a total of 1,319,000 — are located in the North Central division, where they form 36 per cent of the number of farms of every kind in that division, as against a normal proportion of 23 per cent for all the farms in the country. In the Western division the proportion for this kind of farm is also above the mean, being 29 per cent. The live-stock farms, which constitute 27.3 per cent of all farms, are also largely located in the North Central division, where we find a total of 917,000 out of a grand total of 1,564,000. No less than 41.7 per cent of the farms of the division are occupied in the live-stock industry, which also plays an important role in the Western division, where it accounts for 28.3 per cent of the farms.

Of the 357,000 dairy farms in the United States nearly half are located in the North Atlantic states, where they form 25.3 per cent of the farms of the region, in place of a normal proportion of 6.2 per cent for the whole

country. There are also many dairy farms in the North Central states, altho the proportion there is only 4 per cent. It rises, however, to 11.4 per cent in the Western division.

The cotton farms are virtually confined to the Southern zone. In the South Atlantic division there are 332,000 farms of this type, and in the South Central 736,000, constituting respectively 34.6 and 44.6 per cent of the farms of every kind. The same remark may be passed on the tobacco plantations — there being 47,824 in the South Atlantic division and 42,000 in the South Central, with the remaining 16,000 divided between the North Central and the North Atlantic, the Western having none. In the South, too, are to be found the majority of the sugar farms, that is to say, of the cane sugar farms. In the North Central and the Western divisions some beet-root sugar is grown.

The vegetable farms are naturally located near the great centres of consumption. Thus 44,000 are found in the North Atlantic states, where they form 6.5 per cent of the farms of all sorts in place of a normal proportion of 2.7 per cent, and 47,000 in the North Central, where they form, however, only 2.2 per cent of all farms. There are only 12,000 vegetable farms in the Western division, but here the proportion rises to 4.9 per cent. This division is the great fruit producing region, having more than 22,000 of the 82,000 fruit farms of the country, the proportion being 9.3 per cent in place of the normal 1.4 per cent of all farms. In the North Central division there are a little more than 20,000 fruit farms (0.9 per cent of the farms of the division), and in the North Atlantic a little less than 20,000 (2.9 per cent of the division's farms).

To sum up: Live-stock and dairy farms are in a majority in the North Atlantic division, a region of varied products. In the North Central almost every

farm is employed in the growing of hay and grain, or the raising of live-stock. In the two Southern divisions cotton predominates below the twenty-fifth parallel, while the more temperate zone above this line has various products in addition to cotton — grains, live-stock, tobacco. In the Western division, looking at the statistics as a whole, there would seem to be a great variety of products, but this is only the case in California and a few irrigated districts. In the extreme North-West cereals form the principal product, while in the vast arid and semi-arid zone extensive live-stock raising is the chief industry.

It must be pointed out that the share of a given product in the general agricultural wealth of the United States is shown only imperfectly by the statistics relating to the number and area of the farms deriving their revenue principally from this product. As a matter of fact, every farm, in addition to the principal product, has some secondary products. Many of the hay and grain farms, for instance, and even a great majority of them, reserve a more or less extensive portion of their land for other products, such as fruits, vegetables, etc. Similarly, hay and grain form a secondary product on many farms. And this may be said of all products. Before attempting to study the different branches in detail it will be well, therefore, to obtain a general idea of the role they play in the agricultural economy of the country. This is possible, thanks to the census statistics relating to the area occupied by, the quantity produced and the value of every product of importance.

The total area under crops is 289,821,549 acres, or about two and a quarter times the total area of France. This is upwards of 125,000,000 acres less than the total area of improved land, the remainder being occupied by meadows, etc., or lying fallow. Cereals account for 63.8 per cent of the total area and 49.1 per cent of the total

value; hay and forage for 21.3 per cent of the area and 16 per cent of the value; cotton for 8.3 per cent of the area and 10.7 per cent of the value. Thus, these three branches alone occupy 93 per cent of the area under crops and represent 75.8 per cent of the crop value. This value is enormous, being more than $3,000,000,000. Of this sum, according to the "Report," $975,000,000 represents the value of the products fed to live-stock, and $2,045,000 the value of the products available for sale or for consumption by the families of the cultivators. To obtain a complete valuation of the agricultural wealth we must add the sum of $1,719,000,000 for the value of the animal products. This gives a grand total of over $4,700,000,000. Subtracting the value of the products fed to live-stock we still have $3,764,000,000, which represents the actual gross income of the farmers of America.

An important question at once arises. How far may reliance be placed on these figures? The unreliability of French agricultural statistics is notorious. The most eminent of those who have had occasion to make use of them, men like M. de Foville, have time and again exposed their defects, propounding, at the same time, plans to improve them. In the United States, however, such statistics, and especially the statistics gathered by the Census Bureau, are prepared more carefully. Each cultivator is questioned personally by the enumerators, who appear to inspire great confidence. Moreover, the rural population of the United States is far less opposed to inquiries of this character than is the same element in the population of Europe. In the Old World, agriculturists are not only less accustomed to making their affairs public; they frequently regard the statistician as the forerunner of the tax-collector. The "Report" tells us that the margin of error must be very small in regard to the principal products — hay, grain and cotton — but that it may be rather large for secondary products, which the

cultivators frequently neglect to declare because of the extremely subsidiary place they hold. Whenever enumerators' bulletins were seen to be at fault, resort was had to correspondence, and many errors were thus corrected. The statistics least to be trusted are undoubtedly those relating to garden and orchard products, and to products consumed as food on the farm, especially poultry, eggs, milk and butter. The enumerators also found difficulty in securing exact information in regard to the sale of animals and the value of animals slaughtered for farm consumption.

All in all, however, the "Report" estimates that the margin of error is only between 5 and 10 per cent of the total value. I am inclined to think that this estimate is rather too low. Are there not, in addition, errors of duplication as a result of misinterpretation of the questions asked or of exaggerated statements by farmers inclined to indulge in humbug or vainglory?

In any event, it must be pointed out that there are serious discrepancies between the census statistics and the routine statistics of the Department of Agriculture. To give an example: for the wheat crop of 1899 the census gives 52,588,574 acres sown and 658,534,252 bushels produced, while the "Statistical Abstract" gives 44,592,516 acres sown and 547,303,846 bushels produced. The difference is enormous, being no less than 18 per cent for the grain sown and 20 per cent for the grain harvested. For the corn crop of the same year, the census gives 94,916,911 acres and 2,666,440,279 bushels, and the "Abstract" 82,108,587 acres and 2,078,143,933 bushels. The former figures exceed the latter by 15 per cent for the area under cultivation and by 28 per cent for the harvest — an excess which is truly colossal. In the case of cotton we find a far smaller difference: 24,275,101 acres and 9,534,707 bales, according to the census, and 23,404,497 acres and 9,142,838 bales according to the De-

partment of Agriculture, a discrepancy of less than 4 per cent for the area and of about the same percentage for the quantity produced. Americans consider the census statistics the more exact. This being so, it is evident that the departmental statistics sin grievously by omission.

However, the degree of error being almost everywhere and almost always the same for any given product — altho, according to the "Report" there is unquestionably more likelihood of error in statistics relating to the South and the West than in those having to do with the North and the East — the figures presented by the "Report" may be safely used for analytical purposes. And, first, let us compare the values of the agricultural production of the different geographical divisions.

VALUE OF FARM PRODUCTS ACCORDING TO THE DIFFERENT GEOGRAPHIC DIVISIONS. (IN MILLIONS OF DOLLARS.)

	Total value.	Net total value. (Deducting value of products fed to livestock.)	Total area in thousands of square miles.
North Atlantic	666,3	494,4	169
South Atlantic	465,5	403,5	282
North Central	2,360,0	1,791,4	765
South Central	888,6	764	620
Western	336,6	288,7	1,187
Alaska and Hawaii	22,0	22,0	597
Total	4,739,1	3,764,2	3,620

It is evident that the North Central division possesses nearly half of the agricultural wealth of the country. However, in proportion to area, the old North Atlantic division is richer even than the North Central, thanks to its splendid market gardens and orchards. Compared with these regions the vast expanse of the Western division (occupying 40 per cent of the total area of the country, Alaska and Hawaii excluded) makes, with its scant 7 per cent of the agricultural production, an exceedingly

poor showing. That it holds any serious place in the economic life of the United States is due simply to the richness of its mines, for its industrial importance, in the strict sense of the term, is almost nil.

It is interesting to proceed a little further and ascertain which states possess the most agricultural wealth. Far ahead of all the others come Iowa and Illinois, states of about equal size and confronting each other from opposite banks of the Mississippi. The products of the first have a round value of $365,000,000, or of a little more than $263,000,000 after the value of the products fed to live-stock is subtracted; the products of the second, $345,000,000 or, the same deduction being made, nearly $264,000,000. Next come Texas ($240,000,000 : $209,000,000), Ohio ($257,000,000 : $201,000,000), New York ($245,000,000 : $182,000,000), Missouri, ($219,000,000 : $161,000,000), Kansas ($210,000,000 : $161,000,000), Indiana $204,000,000 : $156,000,000) and Pennsylvania ($208,000,000 : $151,000,000).

These nine states (the only ones having a product worth more than $200,000,000, or $150,000,000 with the necessary deduction of the value of the products fed to live-stock) are, with the exception of Texas, contiguous and form a band slightly inclining towards the south and running from east to west on each side of the forty-first parallel. They account for nearly half of the total agricultural production. If to them be added Nebraska, which is tenth in order of importance and is bounded by Kansas and Iowa, more than the half is accounted for. Four other states have a net production of over $100,000,000 — Minnesota, Michigan, Wisconsin and Kentucky. The first three touch, on its northern side, the band formed by the agricultural states, par excellence; the last flanks it on its southern side. Geographically the agricultural region of the United States is assuredly well defined.

CHAPTER III

THE PRODUCTION OF CEREALS

The surpassing importance of cereals in the agricultural wealth of the United States may be indicated in a few words. They represent more than half the total value of the country's crops, their value being $1,484,000,000 out of a total $2,910,000,090.[1] The land cultivated for cereals, 184,994,588 acres, constitutes 44 per cent of the total of improved land, and nearly two-thirds (63.8 per cent) of the total of cultivated lands properly so called, which yield an annual harvest. It is not uninteresting to compare these figures with the statistics we possess concerning the cereals of our own country. According to the agricultural inquiry of 1892, instituted at about the time when the agriculture of France was most prosperous, cereals occupied an area of 37,000,000 acres out of a little less than 85,000,000 acres corresponding to the " improved land " of the Americans, and out of 63,000,000 acres producing crops. The proportion was then — and is still — almost the same in France as in the United States. In respect to the value of the product, however, cereals play much the less important role in France. Even by adding to the value of the grain the value of the straw, concerning which the American statistics are silent, our cereals are far from attaining the percentage shown by the cereals of the United States. Forage growths, the grape-vine and the sugar-beet, swell

[1] This does not include $110,000,000 worth of forest products, bringing the total value of the vegetable products of the country to $3,020,000,000, of which the cereals would constitute only 49.1 per cent of the total. Including the $1,710,000,000 worth of animal products, the cereals would amount to but 31.6 per cent of the total.

our total, compensating for the complete absence of that trans-Atlantic industrial culture, cotton.

All the world knows how rapid has been the progress of cereal production in the United States. There is no slackening. Indeed, there is palpable acceleration. The census of 1880 gave 118,805,952 acres under cereals; that of 1890, 140,378,857 acres; that of 1900, 184,994,588 acres. The increase is thus more than 44,000,000 acres, or 31 per cent from 1890 to 1900, in place of 21,000,000 acres, or 18 per cent, from 1880 to 1890. For the twenty years the increase has been no less than 65,000,000 acres, or 56 per cent.

It goes without saying that the gain has not been equally distributed in all parts of the country. Of the 65,000,000 acres added during the two decades, 1880–1900, 10,000,000 are to be put to the credit of the two Dakotas, entered by colonization virtually only twenty years ago and then possessing only 500,000 acres under cereals. Three other states, neighbors of the two preceding — Minnesota, Nebraska and Kansas — have each gained from 7,000,000 to 8,000,000 acres, or 23,000,000 acres for the three, a three-fold increase in sowings. Thus 33,000,000 acres, or almost half the total gain, must be credited to five states which, in 1880, were practically virginal. The geographical group comprising these states is completed by Iowa, the development of which, however, was far more advanced twenty years ago, when it already had 11,500,000 acres under cereals. Still, it too shows a remarkable gain, a gain of no less than 5,000,000 acres. So that out of the total of 65,000,000 acres, 40,000,000 acres are contributed by these six states situated on the western bank of the upper Mississippi and on each side of the middle Missouri.

Passing south from this group of highest activity another group is found boasting remarkable gains in cereal production. This group consists of Oklahoma, Indian

Territory and Texas, all of which, but especially the two first, may be called "new." In 1890, Oklahoma, which was then opened for the first time to colonization, did not have 20,000 acres under cereals; in 1900 it had close upon 3,000,000 acres thus cultivated. Indian Territory, of which an exact census was taken for the first time in 1900, but of which it may be confidently asserted that it possessed almost no cultivated land twenty years ago, had, according to the 1900 census, about 1,600,000 acres under cereals. Finally, Texas more than doubled its sowings, showing an increase over 1880 of nearly 4,000,000 acres. The increase for the three states taken together was about 8,000,000 acres.

It is thus apparent that the progress of the last twenty years of the nineteenth century, for more than two-thirds of the total increase in cereal production, came from a strip of country extending from the Canadian frontier to the Gulf of Mexico and bounded laterally by the ninety-third and one hundred and third parallel of longitude. Strictly speaking, this strip is slightly narrower than these boundary lines would indicate, because the western half of the two Dakotas and no small portion of Kansas and Texas are almost unavailable for agricultural purposes by reason of drouth, and have contributed nothing to the increase. As a matter of fact, the cereal region does not extend beyond the one hundredth parallel of longitude.

In the eight states and territories lying between this zone and the states bordering on the Pacific, the production of cereals in 1880 was as insignificant as the population was sparse. Since then there has been a notable increase in population, but hardly any development in the direction of cultivating the land. In none of these immense states, each of which has an area of from 50,000,000 to 90,000,000 acres, has there been a gain in cultivated land of more than 500,000 acres. Not only has

agricultural colonization left these states comparatively untouched, but at best it can make only a feeble impression on them because, as I have said, they are insufficiently watered. One must pass beyond this arid region, pass even to the shores of the Pacific, before one will find new lands available for agriculture. But it must be said that in the three Pacific states themselves the gains shown in the way of cereal production are much less than might reasonably be expected. From 1880 to 1900 California increased its sowings only by 1,500,000 acres, or 65 per cent. Oregon did not quite double them with a gain of 600,000 acres. In the extreme North-West, however, Washington, which had only 135,000 acres under cereals in 1880, had fully 1,350,000 acres thus sown in 1900. For the three states the increase totals only 3,500,000 acres, a gain in no wise comparable with the progress shown by the great central strip.

East of this strip, some good gains are found in the country lying between the Ohio and the Great Lakes and roundabout the middle Mississippi. Illinois, Michigan, Missouri, Indiana and Ohio each show an increase of from 1,000,000 to 2,500,000 acres. Furthermore, the majority of the Southern states, which formerly neglected the production of cereals, are now paying more attention to it. This is especially true of Arkansas and Louisiana, the former having nearly 3,000,000 acres under cereals, as against 1,500,000 acres twenty years ago, and the latter boasting 1,500,000 acres in place of the 800,000 acres of 1880. Nearly all the others have gained more or less. In fact, this relatively older region has in this respect advanced more rapidly than has the far West.

On the other hand, there is one large section in which, so far from increasing, the production of cereals has actually lost ground during the past twenty years. This section comprises the old states bordering on the Atlan-

tic — Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland and Virginia. These form, from the Canadian border to the thirty-sixth parallel, a band which would be continuous were it not interrupted by Pennsylvania. And even in Pennsylvania the increase is so slight as to be negligible. Taken as a whole, this region of early colonization, of mediocre and often exhausted soil, imposing high expenses on the cultivator, suffers as does Europe from the competition of the West. Grazing and the production of milk have largely taken the place of husbandry. And even these new methods of utilizing the soil hold their own with difficulty, for the development of refrigerating processes has allowed the products of the West to invade their markets. Pennsylvania, which in 1880 still ranked seventh among the cereal states, was fifteenth in 1900; New York had fallen from thirteenth to twenty-first place, with a decrease in the area under cereals of 550,000 acres, or 15 per cent.

Owing to these variations, a notable displacement of the centre of cereal production has been brought about. In 1860 the centre was in Indiana, not far from the Ohio line, at 85° 59′ west longitude. By 1880 it had passed into Illinois, at 89° 19′. By 1890 it had almost reached the western boundary of that state — the Mississippi River — being located at 91° 13′. It has now crossed the great river, the census of 1900 placing it in Iowa at 91° 38′. This movement towards the west has been accompanied by a displacement in a northerly direction, from 39° 29′ north latitude in 1860 to 40° 37′ in 1900. Minnesota, the two Dakotas, Iowa and Nebraska, today the great centres of production, are in a more northerly latitude than Pennsylvania, Ohio, Indiana and Illinois, which were the principal producing states forty years ago. It should be observed, however, that the westerly movement perceptibly slackened during the last decade. In-

stead of advancing nearly 125 miles, as it had regularly done during each of the preceding decades, the centre advanced only about 25 miles.

Here is a significant fact, concerning which the "Report" has this to say: "The suspension of this westerly progression in the last decade raises the inquiry whether the westward movement is not approaching its limit, and whether the future growth of cereal production will not depend more upon methods of agriculture and less upon the opening up of new lands in the West." In very truth, there appears to be a dearth of new land. No longer, as was the case in 1880, are there vast stretches of virginal soil between the western confine of colonization and the eastern confine of the semi-arid zone. Today the two boundaries all but meet.

By this I do not mean to say that there is not, in the recently colonized states, and outside of the arid zone — in Minnesota, in Iowa, in the two Dakotas, in Kansas and in Nebraska — land not yet opened up and suitable for cereal production. Such land there is, and in great quantity. But the quality is deficient. Almost every section having moisture sufficient for agricultural purposes has been invaded by colonization, which is today in possession of all the really good land. As a matter of fact, all the lands that are left, in point of virginal country where even the most fertile soil is yet unoccupied, are some sections of Indian Territory which will be available for settlement so soon as the treaties with the tribesmen have expired —that is to say, very soon; and certain parts of Texas, Washington and Oregon. On the other hand, north of the Canadian frontier, is a vast expanse of wonderful fertility still awaiting colonization. This is why so many Americans are emigrating to Canada. In the United States itself, however, if cereal production is to continue to increase, there must be a development of the vacant land found in states already colonized, land

which, without being worthless, is neither of remarkable fertility nor of good location. That such a movement is actually under way at the present day is shown by the census statistics. The increases that we have noted for the states east of the Mississippi during the period 1880–1900 have, for the greater part, been made during the ten years 1890–1900.

As the "Report" says, it is also necessary to improve agricultural methods. This will become the more indispensable the less fertile are the lands available for production. I have already pointed out how summarily the soil is treated by the agriculturists of the United States. This is particularly true of the soil under cereals. If we examine the "hay and grain" farms (in the vast majority of cases more grain than hay is grown) we find that the cost of fertilizers is almost nil in the great producing states. It attains, at the maximum, an average of $93 per farm in Maryland. But Maryland is only a small producer. In Pennsylvania and in New York, the only Eastern states wherein cereal production is of any importance, the cost of fertilizers is only $18 and $25 per farm. So soon as the Alleghanies are crossed it falls lower still. In Ohio, it is only $10 per farm, in Indiana, $7, in Illinois, $3. In no other of the great producing states does it exceed $2 per farm, and the farms of these states are much larger than the farms of Ohio, Indiana and Illinois. This means that the purchase of fertilizers is the exception and not the rule. Farm manure is doubtless used for fertilizing purposes, but to how small an extent may be easily imagined when one remembers that the farms of the United States average nearly 150 acres and that the average is much higher in the West.

That extensive cultivation is the practice in the United States is also shown by the cost of labor. In Missouri, which in point of cereal production stands sixth

among the fifty states and territories, this item amounts annually to only $31 per farm. In Iowa, which stands first, it is still at only $60 per farm. In Kansas, Nebraska, Indiana and Ohio, all of which are among the ten principal producing states, it varies from $45 to $58 per farm. This is far from representing the annual wages of a man,[1] especially in the Central divisions, and it follows that in the states just named the farms are generally operated by the cultivator and his family without outside assistance, and this altho their average size varies from 100 acres in Ohio to 200 acres in Nebraska. Doubtless, however, helpers are engaged during the harvest season. In Illinois, the second cereal state, the annual cost of labor is still less than $100 per farm. It reaches $112 in South Dakota, $128 in Minnesota, and $216 in North Dakota. But the size of the average hay and grain farm in these states is 200, 325 and 350 acres respectively. In the far West, in Washington, Oregon and California, the labor bill amounts to $310, $166 and $414 respectively, but these figures are for farms averaging 400, 325 and 500 acres. Even if the operator were permanently assisted by a "hired man"— and these figures indicate that he does not employ more than one helper — it is clear that he could not give his farm anything like intense cultivation no matter how many domestic animals he might possess or how much use he might make of agricultural machinery. It may be said, incidentally, that the average value of such machinery, per cereal producing farm, is $187 in the North Central division, but it mounts to $328 per farm in North Dakota, $335 per farm in Washington, and $425 per farm in California.

The leading cereal states are the following: Iowa, 16,920,095 acres; Illinois, 16,769,010; Kansas, 13,326,-

[1] It should be noted that in the cost of labor is included the estimated value of the food and lodging given to the wage-earner.

940; Nebraska, 12,071,703; Minnesota, 11,207,069 and Missouri, 10,423,745. These are the only states having more than 10,000,000 acres under cereals. Next come, in descending order, Indiana, Ohio, Texas, South Dakota, North Dakota, Wisconsin, Kentucky and Tennessee, which have more than 5,000,000 each. Then, with from 2,500,000 to 5,000,000 acres, come Pennsylvania, Michigan, Georgia, California, North Carolina, Virginia, New York, Alabama, Arkansas and Oklahoma. The remaining states and territories have fewer than 2,500,000 acres under cereals.

Having examined the general characteristics of the cereal production, we need only state for each particular cereal the total area given over to its production, the total quantity produced, the total value of the product, and the return per acre, and then indicate the geographical distribution:

EXTENT OF CEREAL PRODUCTION IN THE UNITED STATES.
(IN THOUSANDS OF ACRES.)

	1880.	1890.	1900.
Wheat	35,430	33,579	52,589
Corn	62,368	72,088	94,917
Oats	16,145	28,321	29,540
Barley	1,998	3,221	4,470
Rye	1,842	2,172	2,054
Buckwheat	848	837	807
Kaffir corn	....	....	266

YIELD AND VALUE OF THE DIFFERENT CEREALS IN 1900.

	Production in bushels.	Yield in bushels per acre.	Value of crop in millions of dollars.
Wheat	659	12.5	369.9
Corn	2,666	28.1	828.3
Oats	943	31.9	217.1
Barley	120	26.8	41.6
Rye	26	12.4	12 3
Buckwheat	11	13.9	5.7
Kaffir Corn	5	19.4	1.4

Wheat, which to us Frenchmen, on account of the role it plays in the foreign trade of the country, is the most interesting American cereal, has its chief centre of production in Minnesota, the two Dakotas, Ohio, Indiana, Kansas and California. It also constitutes almost all the cereal production of Washington and Oregon. For some years past (1893–1902) the proportion of the quantity exported to the total production has never been less than 31 per cent, while in 1894, 1898 and 1901, it amounted to 40 per cent.

The centre of the corn production is in Illinois, Iowa, Kansas, Missouri and Nebraska. With the exception of the Pacific Slope, corn, however, is grown almost everywhere in the United States, and especially in the South. It is the American cereal par excellence. Little of it is exported (from 2 to 11 per cent of the annual crop during the last ten years), but it reaches us in great quantities, nevertheless, in the form of beef and ham, corn being a staple fodder in the United States.

The production of oats is carried on chiefly in the states bordering on the Great Lakes — Wisconsin, Michigan, Illinois, Ohio, New York and Pennsylvania. The export trade in this cereal is very light.

Barley and rye — the latter used almost altogether for distilling — are of comparatively small importance in the agricultural economy. The production of the former is virtually confined to California, Minnesota, Iowa and Wisconsin. The latter is also grown in Wisconsin, and in Pennsylvania, New York, Nebraska and Michigan. Buckwheat is grown to some extent in New York and Pennsylvania, but only in small quantities elsewhere. Kaffir corn is almost altogether a Kansas product.

CHAPTER IV

THE LIVE-STOCK AND DAIRY INDUSTRIES

The live-stock industry, with its various branches, occupies in American agriculture, a place almost as important as the production of cereals. During the year preceding the census of 1900 the round value of animals sold for slaughter or slaughtered on farms, of dairy products and of wool was $1,421,000,000,[1] or only 4 per cent less than the value of the cereals. Numerically, live-stock and dairy farms compare most favorably with hay and grain farms, there being no less than 1,922,000 of the former, as against 1,319,000 of the latter.

This is a feature sharply differentiating American agriculture, not only from the agriculture of France, but from the agriculture of most of the countries of Europe, where cultivation proper, and especially cereal cultivation, is of much more importance than the live-stock and dairy industries. Of all Western and Central European countries of advanced civilization Great Britain is the only one situated similarly to the United States in this respect. In the British Isles, indeed, the animal products are of the greater value, but this is due to cereal insignificance rather than to any impressive development of animal production. The United States, in fact, leads the world in both these great branches of agriculture.

The number of domestic animals found in the great republic is shown in the following table, wherein the animals on farms and ranges and those found elsewhere (that is to say in towns and cities, or in industrial establishments) are enumerated separately. Only the value

[1] Exclusive of $281,000,000 worth of poultry and eggs.

of the farm and range animals has been ascertained with exactitude, it being supposed, for the purpose of evaluating the whole, that the others have, on the average, a similar value:

THE DOMESTIC ANIMALS OF THE UNITED STATES.
(IN THOUSANDS OF HEAD.)

	Number on farms.	Number outside of farms.	Total value (In millions of dollars.)
Horses	18,280	2,937	1,051.0
Mules	3,271	174	217.9
Asses	95	16	6.8
Cattle	67,822	1,616	1,517.6
Sheep	61,605	231	171.0
Goats	1,871	78	3.4
Swine	62,876	1.818	238.7
Total	215,822	6,871	3,196.4

These figures show, first of all, that the United States has more mules, cattle and swine than any other country. It is probable, indeed, that in regard to the first it possesses half the world's supply. Its supremacy in regard to cattle is not so marked. But the country most closely following it — Russia — had, in 1900, only 43,000,000 cattle, while the Argentine Republic, which ranks next, can count only 22,000,000. If we call to mind the fact that the agricultural inquiry of 1892 credited France with but 217,000 mules, 12,708,000 oxen, cows and calves, and 7,422,000 swine, we shall form a clearer idea of the value of this asset of the United States.

Russia, with 25,000,000, leads the United States in regard to horses, but the republic is far ahead of all other countries, the next nearest — Argentina — having only 4,500,000. Next in order come Germany and Austro-Hungary, with about 4,000,000 each, France with 2,795,000, and, finally, the British Isles, with barely 2,000,000. If to the 21,000,000 horses in the United States be added

the 3,500,000 mules, a species of animal not very numerous in Russia, the American Union is not so far behind the Empire of the Czars. And, if it be remembered that the transportation facilities of Russia are far inferior to those of the United States, and that, as a consequence, a greater number of horses must be employed for cartage purposes in the former country, the conclusion inevitably reached is that the agriculturists of the United States use many more horses and mules than do the agriculturists of any European country. A fact which, as I have already remarked, is not without significance when the question of the causes of American agricultural supremacy is raised.

In respect to sheep the United States is not so well off. It is passed by Australia which, ten years ago, possessed no less than 120,000,000 of these animals — a total, however, which has since been reduced by about a third owing to long and repeated drouths. It is also behind Russia and Argentina, but is far ahead of France, which has a scant 22,000,000. In fact, it yields to us only in the matter of asses and goats, we having 358,000 of the former and 1,845,000 of the latter. Still, it must be said that France is not one of the countries possessing these animals in most abundance. They are found chiefly in rocky and sterile regions. So it is not surprising that the United States should be poorly supplied. Moreover, the asses found there are reared almost exclusively with a view to the production of mules.

Summing up, then, we find that cattle constitute not only the largest, but the most valuable animal asset of the United States. They represent, indeed, about half the total live-stock value. From the export standpoint they are also of the greatest importance. To them, therefore, our attention should first be directed.

In the countries of Europe, cattle are generally classified in four divisions — working oxen, beef cattle, milch

cows, and breeding cattle. This is the procedure adopted in France. In the United States, however, working oxen are practically an unknown quantity, horses being employed almost exclusively in the northern sections and horses and mules in the southern. Oxen are used for field work in but a few New England states (states, moreover, that can hardly be called agricultural) and in two or three Southern states, and their employment even there is very exceptional. We are justified in including virtually all of the country's oxen, a total of 15,257,000, under the heading of beef cattle. There are 15,333,000 calves less than a year old, all of which are destined either to be fattened for the market or to recruit the ranks of the cows and breeding cattle. The cows include 7,184,000 heifers between one and two years old, 17,140,000 milch cows, and 11,592,000 breeding cows. There are also 1,315,000 bulls. These figures, of course, refer only to the cattle found on farms and ranges. About 1,615,000 head are found in the towns and cities, more than three-fifths of this total — 973,000 to be exact — being milch cows. It is clear that the production of both meat and milk is actively carried on in the United States.

These cattle are the descendants of animals introduced from Europe since the discovery of the New World, which had hitherto been without any of our farm animals. There are two principal strains. One may be traced back to cattle imported by the Spaniards first into Mexico and then into Florida. From these have come the cattle of the South-West and a portion of those of the South-East. The other, which comprises the cattle of the North, the Centre and the North-West, has its origin in cattle introduced into the North-East by the early English colonists. Whatever the origin, however, little care was given to the animals during the younger days of the country, with the result that by the beginning of the nineteenth century they had

greatly degenerated. Especially might this be said of the South-Eastern cattle, upon which the humid and semi-tropical summers had an extremely bad effect. Since 1840, however — according to some the date is 1816 — cattle of better breed have been imported, and excellent results have been obtained by crossing these with the native cattle, which have rapidly improved, especially in the states of the North, the Centre and the West. The quality is still mediocre, however, in all the Southern states except Texas.

Even when the quality is as high as that of the cattle of Europe, the average value remains much lower. For beef cattle of from two to three years old it is about $29.12, for milch cows $29.68, for calves a little less than $9. Needless to say, these figures vary according to the geographical division. For beef cattle of the age given above the highest value is found in the North Central, where the average is $34.47, with an average of nearly $40 in Iowa. The minimum value is found in the Southern divisions, the average being a little less than $20 in the South Atlantic and about $21 in the South Central. In Georgia it is as low as $7. For milch cows the best prices obtain in the Western division, where such cows are scarce, the average being $35.50, with a maximum of $42 in Montana. Next come the North Atlantic and North Central divisions, with $32 and $31.50, and, last of all, the two Southern divisions, with $23 for the one and less than $22 for the other. The minimum, $13, is found in Florida.

These variations in price correspond, in the main, with variations in weight. It should be added that the average value and weight have noticeably increased as a result of crossing with selected stock. The best proof of this is the fact that in the interval between the two censuses of 1890 and 1900 the total value increased by $426,000,000 while the number of head diminished by

5,159,000 — a value increase of 46 per cent per head. Now, it is true that prices were higher in 1900 than in 1890 as the result of an increased demand due to widespread prosperity, but this offers only a partial explanation of the increase in value. Chicago quotations for fair to choice beeves varied, in the course of the years 1889–1890, from $4.50 to $5.45 per hundredweight; in 1899–1900 they ran from $5.80 to $7.00. The increase is only about 30 per cent, and it follows that a large part of the increase in value comes from an increased weight in the animals.

The weight increase is all the more noteworthy since it has brought about a perceptible decrease in the age at which cattle are sent to the market. It must not be inferred, from the numerical decrease to which attention has already been drawn, that the American live-stock industry is falling into decay. Although a direct comparison between the figures of the censuses of 1890 and 1900 is impossible, by reason of differences in the method of classification and in the questions put to breeders, graziers and dairymen, the "Report" shows very plainly that the number of milch cows has appreciably increased (by at least 10 per cent) and that the number of other cows has also increased, perhaps by an even greater percentage. This is also true of the calves. On the other hand, the number of beef cattle shows a remarkable falling off, a decrease, indeed, of probably 20 per cent. It follows that fattened steers are marketed and slaughtered at a younger age than they were ten years ago, the difference being estimated at six months, the present average marketable age being thus two instead of two and a half years. Two factors appear to have operated in bringing about this decrease in the marketable age. In the first place, thanks to more careful breeding and rearing, an animal of two years often weighs today as much as an older animal would weigh in the past; in the second place,

the increase in price, due to the increased consumption already noted, has had the effect of inducing stockmen to part with animals that under other circumstances they would have longer retained.

The live-stock industry, like cultivation proper, is conducted on the extensive principle. The area of the average American stock farm is not less than 225 acres, of which only 85 acres consist of improved land. It must be said, however, that in the Western division and in those parts of the North Central and South Central which border on the Western, we find some farms apparently small in area yet containing an exceedingly large number of cattle. At first glance this is incomprehensible, but it is readily explainable by the fact that, altho the farm itself may be small, the cattle have the run of adjacent and vast tracts of unappropriated land. There are even cases where no portion of the soil of a stock farm has been regularly acquired, the operator merely erecting some very crude buildings on the public domain. However, this type of farm is passing away on account of the diminution of ownerless good land. According to the census of 1900, there are in the states of the West only 422,000 cattle (or less than 5 per cent of the total in the region) on ranges of which no portion, or at least no portion of more than 3 acres, has been regularly appropriated.

Of the 67,822,000 cattle in the United States, 821,000 are found on farms of less than 3 acres, which average 41 head, and which represent, in the main, the ranges just mentioned. Farms of from 3 to 20 acres have 1,100,000, with an average of 3 head per farm. There are 3,625,000 head on farms of from 20 to 50 acres, the average being 4 per farm, and 8,025,000 on farms of from 50 to 100 acres, the average being 6.7. All these are what are termed "small farms." Of the 12,700,000 head (exclusive of range cattle) which they contain, 4,000,000 head

are milch cows. Farms of from 100 to 175 acres have 15,605,000 head, or an average of 12 head per farm. Of these 5,500,000 are milch cows. The average rises to 18 head for farms of from 175 to 260 acres, which have 8,350,000 head, including about 2,650,000 milch cows. These farms, of from 100 to 260 acres, constitute the "average farm." Passing to the "large farm" we find 10,333,000 head, or an average of 29 head, on farms of from 260 to 500 acres. These farms, however, have less than 2,300,000 milch cows. Farms of from 500 to 1,000 acres average 55 head per farm, with a total of 5,358,000 head, of which only 689,000 are milch cows. Finally the average rises to 329 head per farm for the extremely large farms, of more than 1,000 acres, their total being 14,605,000 head with but 375,000 milch cows. In short, about a third of the 17,000,000 dairy cattle in the United States must be credited to farms of less than 100 acres, another third to farms of from 100 to 175 acres, and the great majority of the remaining third to farms of from 175 to 500 acres.

The size of the average dairy farm, it might be said in passing, is only 120 acres. On the other hand, leaving the dairy cows out of account, it is seen that the majority of the others, the breeding and beef cattle, are located on farms of more than 260 acres. In the case of stock-raising proper, the dominance of the very large farm is most clearly marked. Of the 11,592,000 cows "other than dairy cows," 5,141,000, or almost half the total, are found on farms of more than 1,000 acres, 1,193,000 on farms of from 500 to 1,000 acres, and 1,573,000 on farms of from 260 to 500 acres, or almost two-thirds of the whole on the large farms.

It is evident that in the United States, as in most other countries, live-stock raising and the production of milk are two distinct industries. And perhaps this is more true of the United States than of any other country.

Live-stock raising is very extensive, while dairy production is necessarily intensive. As we have just seen, the same farms are seldom occupied with both, altho almost every farm, whatever its chief source of revenue, except the cotton farms of the South, boasts at least one or two cows, kept, however, chiefly for the purpose of meeting the needs of the farmer's household. Moreover, live-stock and dairy farms have their peculiar geographical areas, and it is even necessary to distinguish between the regions of raising proper, the regions where the animals are bred, and the regions in which they are grazed.

Viewing the cattle as a whole, however, we find that 45 per cent of the total number and over 50 per cent of the total value stand to the credit of the North Central states, which have 30,621,000 head, worth $753,000,000. Next comes the South Central division, with 17,870,000 head, worth $313,000,000, and then the Western, with 8,455,000 head, worth $191,000,000. The North Atlantic has only 6,340,000 head, worth $152,000,000, and the South Atlantic, 4,432,000 head, worth only $66,000,000, a sum which is itself a significant commentary on the backwardness of this region in regard to both breeding and dairy production.

Among the individual states Texas is far in the lead, with nearly 9,500,000 cattle, worth $163,000,000 — one-seventh of the total number, and one-ninth of the total value. It is followed by Iowa, situated in a much more northerly location, with more than 5,000,000 head, worth $142,000,000. Incidentally, I might add that from almost every point of view Iowa is the leading agricultural state of the entire Union. Kansas comes third, with 4,500,000 head, worth $117,500,000. Nebraska is fourth, with 3,176,000 head, worth $82,000,000, and Illinois fifth, with 3,104,000 head, worth $82,000,000. The geographical entity formed by Oklahoma and Indian

Territory, which are soon to be united in a single state, would be ranked ahead of Nebraska and Illinois, were it not that their 3,200,000 head are worth only $57,000,000. Then follow Missouri, nearly 3,000,000 head, worth $75,000,000; New York, 2,596,000 head, worth $62,000,000; Ohio, 2,000,000 head, worth $46,000,000; and Wisconsin, $2,300,000 head, worth, however, only the same sum as the cattle of Ohio. These are the principal live-stock states. Pennsylvania, Minnesota, Indiana and South Dakota have from 1,500,000 to 2,000,000 head.

To sum up: the great centre of live-stock production is found west of the Mississippi River, a little farther to the south and to the west than the centre of cereal production, but in large measure coinciding with the corn belt — which is only natural in view of the fact that corn forms a staple fodder. The West proper, in short, holds a more important place in the live-stock industry than it does in the production of cereals: the reverse obtains in regard to the states east of the Mississippi.

The primacy of the states of the South-West is especially noticeable in regard to stock-raising proper. The share of each state may be shown statistically by the number of cows, "other than dairy cows," which it possesses. Of the 11,599,000 cows of this class, 3,370,000, or nearly one-third, are in Texas, 860,000 in Kansas, 775,000 in the Oklahoma-Indian Territory group, 674,000 in Nebraska, a little further north, and 502,000 in New Mexico. These six states thus account for more than half the total number, and all six, it might be observed, are well west of the Mississippi. Colorado has 483,000 head; Iowa, 461,000; Arizona, 357,000; Missouri, 324,000; and California, 304,000. It must be said that in the extreme South-West these animals are not very valuable. In Texas, New Mexico and Arizona they are worth only $18 per head, as against more than $30 in Iowa and Nebraska.

In these last named states, and in the states by which they are bounded, the cattle are generally raised at home, the immense cornfields of the region providing abundant and excellent fodder. It is quite different, however, with the cattle of the South-West, which are frequently sent into this very section to be fattened for delivery to the abattoirs of Chicago, Omaha and Kansas City. Thence, in the form of prepared meat, they come to us in Europe. The importance of this branch of the American export trade is well known. In 1902, no less than 400,000,000 pounds of beef, frozen, canned, or salted, and worth $38,500,000, were exported from the United States; in addition to which, during the same year, 393,000 head of cattle, worth $30,000,000, were shipped abroad, chiefly to Europe. So that, in all, the bovine race contributed nearly $70,000,000 to swell the total value of the American exports.

If stock-raising proper is chiefly an industry of the South-West and, in combination with grazing, an industry of the Centre, the latter region and the states of the East easily hold first place in respect to dairying. Of the 17,000,000 dairy cows, 1,501,000 are found in New York, 1,423,000 in Iowa, 1,007,000 in Illinois, 998,000 in Wisconsin, 943,000 in Pennsylvania, 861,000 in Texas, 860,000 in Kansas, 818,000 in Ohio, 765,000 in Missouri and 753,000 in Minnesota. The "Report" gives the total production of butter as more than 1,000,000,000 and of cheese as over 250,000,000 pounds. This branch of agriculture is developing with great rapidity, improved methods of transportation and processes of preservation allowing it to take root far from the great centres of consumption. The same may be said of the production of milk, concerning which the "Report" observes: "The greater number of large cities now find the source of their milk supply at considerable distances, the milk being brought by special trains. The handling of this supply

for the large cities has given rise to a complicated business, which cannot be described here. Mention may be made, however, of the sterilization of milk, after which process it may be kept sweet and wholesome for a long time." Evidently we have much to learn from the Americans in this respect.

We might also imitate to advantage the splendid organization of their butter and cheese industry. More than a third of the butter produced is made in factories and creameries, while fully a quarter of the cheese comes from factories. In 1902 the exportation of butter amounted to 160,000,000 pounds, worth nearly $3,000,000, and of cheese to 26,000,000 pounds, worth about the same amount as the butter. The cheese exports, however, have latterly shown a falling off.

Assuredly the live-stock industry and its subsidiary branches are exceedingly prosperous in the United States. At the same time, Europe has certainly more to fear from the competition of the producers of cereals. The advantages so long enjoyed by the stock-raisers of America are bound to diminish in proportion as the amount of "free land" grows smaller. Moreover, the home consumption appears to be increasing more rapidly than the supply, so that the surplus available for exportation is bound to decrease.

CHAPTER V

THE PRODUCTION OF COTTON

Next to cereals, hay and live-stock, the chief agricultural resource of the United States is cotton. In 1899, the year to which the agricultural statistics of the census of 1900 apply, the area under cotton was 23,257,000 acres, or 8.4 per cent of the crop-bearing land. But the value of the cotton crop was no less than $370,000,000, or 12 per cent of the total crop value. For no other staple, agricultural, industrial or mineral, is the primacy of the United States so clearly established. If it has more cattle, if it produces more wheat, oats, petroleum, coal, iron and lead than any other country, if it furnishes more than half the world's supply of corn and copper, it also provides over three-fourths of the cotton supply. Throughout the nineteenth century cotton was the backbone of its agriculture. Cotton is still its chief reliance. In 1902 out of a volume of export trade of $1,400,000,000 fully $300,000,000 must be placed to the credit of cotton. Assuredly the leading modern textile is of vast importance in the economic life of the United States.

Cultivated from time immemorial in India, and before the Christian era in China and in Egypt, cotton was known to the ancient Mexicans and Peruvians long before the Spanish conquest. When Columbus discovered the New World he found cotton-plant in the West Indies. It does not appear to be indigenous to any section of the continental territory of the United States. It was introduced into the country in 1721, and from that year was grown in Virginia and the two Carolinas, but long for local consumption only. It was not until 1784 that it was

exported from Virginia for the first time — to the amount of eight sacks, weighing 1,200 pounds. The development of spinning machinery by Hargreaves, Cartwright and Crompton at the end of the eighteenth century and the invention of Whitney's cotton gin about the same time, paved the way for an enormous development of its industrial utility, and the United States, whose exportations in 1790 still met only one-sixth of the British demand, made ready to produce it in enormous quantities. The following table, borrowed fram the "Report," will give an idea of the progress made during the nineteenth century:

Crop of	Number of bales (in thousands)	Average number of pounds per bale.	Total weight (in millions of pounds).
1790	8.9	225	2
1800	177.8	225	40
1810	320	250	80
1820	681.8	264	180
1833	1,312.7	339	445
1839	2,053.2	385	790
1849	2,469.1	400	988
1859	5,387.1	445	2,397
1869	3,012	440	1,325
1879	5,755.4	453	2,607
1889	7,472.5	477	3,564
1899	9,534.7	495	4,717

It will be seen that gains were steadily made, except during the Civil War decade, 1859–1869, when the cultivation of cotton became almost a thing of the past. During the preceding ten years, development had been most rapid, as a result of the increased demand produced by an era of exceptional prosperity in Europe, and history tells us how great a crisis arose in consequence of the almost total cessation of American exports. Today the cotton production of the United States is about double what it was on the eve of the Civil War.

To have thrived thus it is evident that cotton must be produced in the United States under very favorable conditions. Such conditions are not found throughout the country, however. In fact the growing of cotton is restricted to the Southern states. It is cultivated hardly anywhere north of the thirty-seventh parallel of latitude or west of the one hundredth parallel of longitude. Only at the beginning of the nineteenth century, before there were any railroads, and later, immediately after the War of Secession, when the Southern plantations were devastated and cotton was very dear, was any attempt made to grow it beyond its natural confines — in the southern part of Illinois and Indiana, and even in the far West, in California, Utah and Nevada. But the attempt was not successful.

Climate is the determining factor. Beyond the boundaries just indicated the winters are too long, and the summers too dry or too cool. Formerly cultivated as a perennial, cotton is now grown in the United States — as in most other cotton countries — as an annual. Thus there is no need for anxiety on the score of severe winters. What is required, however, is that the cold season come late enough and be short enough to give the plant time to develop and ripen. It is also necessary that the heat of summer shall be intense and steady and accompanied by rains, not continuous but frequent, starting from the end of the second month after the seeds are planted. All these conditions are found in the Southern section of the United States. In certain districts, in parts of Tennessee, Arkansas and Indian Territory, the average temperature for January is lower than the January temperature of Paris. Almost all the South, indeed, except the Gulf of Mexico region, is subject to cold waves, during which the mercury sometimes falls to 10 or 15 degrees below zero, and to blizzards which cover the ground with two or three feet of snow.

But that matters little. The prime desideratum is that the winter come to an end in time to allow the ground to be worked between the fifteenth of February and the first of April. The seeds are planted in April. While some humidity, tho not any great amount, will not be harmful at that time, the plant does not require rain during the first six or eight weeks after planting. They say in the South that a dry May promises a plentiful harvest. From that time on, however, a very high temperature, in conjunction with copious rains, is absolutely necessary.[1] Throughout the cotton belt the average temperature for the months of July and August exceeds 25 degrees centigrade, while it does not reach 19 degrees in Paris. The pods containing the fibre do not ripen all at the same time, so that the gathering of the crops occupies many weeks. As a general thing, the harvest, which begins in August, is at an end by the closing week of October, but in the case of cotton growing in clayey soil it often continues until the first of December. For this reason planters dread an early winter.

Even within the limits placed by nature, the cultivation of cotton is unevenly distributed. The cotton region comprises fifteen states and territories, all of which grow more or less of the valuable staple. Three, however, Virginia, Kentucky and Missouri, have only a very small portion of their territory below the thirty-seventh parallel, and consequently a narrowly delimited area under cotton. In Virginia, the cotton fields are in fact diminishing in extent. This phenomenon is also observable in Tennessee, while in North Carolina production has never regained the importance it had before the war. Increased improvements in methods of transportation have tended to concentrate cotton growing, like all other kinds of production, in the most favorably situated localities. Not

[1] Where large quantities of water are available the rainfall can, of course, be supplemented by irrigation. Such is the practice in Egypt and Turkestan.

only has it receded towards the south, but it has also advanced in a westerly direction. In 1850 only 12 per cent of the annual crop was grown west of the Mississippi, Louisiana being the only state on that side of the river to have fields of any size. By 1860 the development of Arkansas and Texas had begun, and the share of the trans-Mississippi states in cotton production had reached nearly 30 per cent. By 1880 the percentage was a little higher; by 1890 higher still, and by 1900 it amounted to nearly half the entire output — to be exact, 44 per cent. The following table gives the distribution by states for the past twenty years. To the census statistics I have appended figures for 1903 taken from the "Financial and Commercial Chronicle of New York," the statistics of which are authoritative:

ACREAGE UNDER COTTON IN 1879, 1889, 1899 and 1903.

	(In thousands of acres.)				Yield in 1899 (In thousands of bales).
	1879.	1889.	1899.	1903.	
Virginia	45	39	25	35	11
North Carolina	893	1,147	1,007	1,117	460
South Carolina	1,364	1,987	2,074	2,317	881
Georgia	2,617	3,345	3,513	4,270	1,288
Florida	246	227	222	317	62
Alabama	2,330	2,761	3,202	3,910	1,107
Mississippi	2,106	2,833	2,897	3,347	1,314
Tennessee	723	747	623	730	234
Louisiana	865	1,270	1,376	1,560	709
Texas	2,178	3,935	6,960	8,230	2,506
Arkansas	1,043	1,700	1,642	1,962	710
Indian Territory	35	70	442	765	155
Oklahoma	....	....	241	467	71
Missouri	32	57	45	60	25
Total (including five other states)	14,480	20,175	24,275	29,990	9,535

The five other states are Kentucky, Kansas, Nevada, Arizona and Utah, but their output is insignificant, their total production for 1899 being only 1,500 bales from an area of about 2,500 acres under cultivation. The six

last states of the table, all trans-Mississippi states, had, in 1879, only 3,290,000 acres under cotton; in 1899, they had 9,327,000 acres thus sown, representing no less than 6,037,000 acres of the total acreage of 9,690,000 gained by cotton in the course of the intervening twenty years. It remains to be said, however, that out of a total gain of 4,720,000 acres from 1899 to 1903 these six states and territories gained only 2,058,000 acres, the high prices brought by cotton having led many of the more south-easterly cultivators to increase their plantings to an exceptional degree. Moreover, the area under cotton in 1903 was much larger than that of any other year.

All in all, it safely may be said that it is to the states beyond the Mississippi that we must look for development in the future. In the South-Eastern states almost all the really good land has been already put under cultivation; some of it, indeed, would be exhausted by now were it not for increasing resort to fertilization. For the farms classified by the "Report" as "cotton farms" — that is to say, farms deriving more than 40 per cent of their revenue from cotton — the average expense for fertilizers rises to $29 and $30 per farm in the Carolinas and Georgia. Now, the area of the average cotton farm is about 85 acres including about 45 acres of improved land, of which 15 to 20 acres are planted in cotton. But the area of the cotton farms of these old states must be, as a rule, below the general average. And it is doubtless also true that, by far the greater part of the fertilizer purchased by them is used on the cotton fields. This means that the cost of fertilizers to the farmers of the Carolinas and Georgia must be about $1.60 per acre under cotton — which is far from being an insignificant item and is in marked contrast to the way in which cereals are cultivated.

For Alabama and Florida the cost of fertilizers is about $12 per year per farm. Passing to the west, how-

ever, it falls to $3 per farm for Mississippi, to $2 per farm for Louisiana, and to $1 or even less for the other states situated beyond the great river. The only Eastern state that expends a really insignificant sum for fertilizers is Tennessee, $1 per farm. This is explained by the fact that the majority of the cotton fields of that state are located in the extraordinarily fertile lowlands along the river. In the trans-Mississippi states, and especially in Texas, Indian Territory and Oklahoma, there is still much land capable of producing, without any particular care, very rich crops; while the soil already under cotton, having been put to use for only a comparatively short time, is far from being spent.

As a matter of fact, statistics having to do with the successive crops of the past thirty years do not indicate any decreasing productiveness. It would seem that any tendency to sterility is successfully overcome by the use of fertilizers and by a more intensive cultivation. The average yield for 1899 was, as may be inferred from the table given above, a little less than two-fifths of a bale per acre, the bale weighing 495 pounds. In the case of the record-breaking crop of 1897 the average ran up to 240 pounds per acre — the highest average for at least twenty-five years. The worst crops have never averaged less than 160 pounds per acre. Analyzing the returns for every harvest since 1875, and making allowance for the annual fluctuations due to climatic influence, it is impossible to find any clearly marked tendency in the direction either of a decrease or of an increase in productiveness. If any tendency were discernible the likelihood is that it would be in the direction of an increase.

Distinct variations are found, however, when we examine the average returns for the different states. In 1899, when the average was a little less than two-fifths of a bale, or 198 pounds, for the whole region, it was above this figure for the two Carolinas, Mississippi, Arkansas

and Louisiana, and below it for the other states and territories. The maximum was reached in Louisiana, with 228 pounds per acre; the minimum in Florida and Oklahoma, with 126 and 128 pounds respectively. Texas, the heaviest producer, had an average of 164 pounds. From the returns issued by the "Report," it appears that districts yielding as high as an average of half a bale per acre are few and far between and of very small extent. Such districts are found only in the alluvial bottoms of the Mississippi valley, in a narrow section of North Carolina and in a few Texas counties. Soil yielding three-quarters of a bale per acre exists only in Louisiana in the lower valley of the Mississippi.

As a rule cotton growing alternates with the cultivation of corn, cotton and corn being the two principal products of Southern agriculture. Previous to the Civil War corn was the more extensively grown, occupying, in the ten leading states, 14,877,806 acres as against only 6,764,030 acres under cotton. After the war, however, and until a recent day, the high prices that could be obtained for the textile — combined with the cereal competition of the West, engendered through the extension of transportation facilities, and the routine spirit of the negroes who knew more about growing cotton than they did about growing corn, and therefore set themselves to producing the former exclusively — caused the cultivation of corn to be neglected. Thus, in 1889, in the same ten states, the area under corn was only 18,858,683 acres, with 20,004,250 acres under cotton. During the last decade, on the other hand, the cultivators of the region have been aroused to a realization of the desirability of crop diversification, and in these ten Southern states corn today, with 25,612,949 acres, once more takes the lead over cotton, which has 23,518,433 acres. This is decidedly a more satisfactory situation than that which has so long existed.

An interesting and distinctive feature of cotton produc-

tion is that it is largely in the hands of cash and share tenants. Farms operated by direct ownership are in a minority. I have already had occasion to explain why the vast plantations of the South were partitioned into a number of small holdings leased to cash and share tenants. In the ten principal cotton states, farms operated directly by the owner constituted, in 1900, but 48.3 per cent of the total, 20.3 per cent being operated by cash tenants and 31.4 per cent by share tenants. In 1880, on the contrary, the proportions were respectively 60.6, 12.4 and 27 per cent. We see that the number of cash tenants has increased more rapidly than that of the share tenants, and, consequently, that many share tenants have become cash tenants. This indicates social progress on the part of the cultivators, for the share tenant — most frequently a former slave or the descendant of a slave — works to a large extent under the more or less effective supervision of the owner. The cash tenant is by far the more independent. On the other hand, so far at any rate as the colored producers are concerned, it must be said that the share tenants are the ones who obtain the best results, averaging exactly two-fifths of a bale per acre — as a result, doubtless, of having put themselves under the guidance of the planters — while the cash tenants obtain an average of only .381 per acre and the owners but .368. Among the white cultivators these proportions are reversed: .40 for the owners and cash tenants, .381 for the share tenants.

Everything considered, the production of cotton is a profitable occupation, the crop bringing an average price of 9 to 10 cents per pound, a return much higher than for any other American product. At the recent high prices — 13 and even 14 cents per pound — Southern agriculture must be accounted very prosperous. Not that it is at all probable that such a high level will be maintained. But whether it is or no, the market is broaden-

ing so rapidly, not only in respect to the civilized nations of America and Europe, but also among the primitive peoples of Africa and Asia, that prices well above the average of recent years may be expected. All in all, the American cotton industry promises to have a brilliant future. For which very reason it behooves the Powers that boast semi-tropical possessions, to take steps to prevent the United States from monopolizing the production of this most important of textiles. Not only will they find cotton growing a source of considerable profit; by broadening the area of cultivation, and thus lessening the dangers inherent in production under local climatic conditions, they will also directly contribute to an increase in the stability of the world's supply.

CHAPTER VI

OTHER PRODUCTS OF IMPORTANCE

While cereals, live-stock and cotton are assuredly the principal American agricultural products, there are several other important commodities in the production of which the Americans have already taken, or appear capable of taking, a foremost place. Their development in regard to these commodities will of course be, as their development in other respects has already been, of the greatest significance both to producers and to consumers in Europe. This makes it all the more necessary to examine with some detail the comparatively minor phases of their agricultural activity, phases, however, which afford a means of livelihood to a great many people and contribute materially to the wealth of certain states.

If I had been writing in the middle of the nineteenth century instead of at the beginning of the twentieth, I should have had occasion to dwell on certain textile cultures in addition to cotton — on hemp and on flax. In regard to the former, however, cultivation has decidedly fallen away in the United States as in France, and as, for the matter of that, in the majority of all the older countries of Europe. In 1859 the production of hemp in the United States amounted to 149,000,000 pounds; by 1899, the year preceding the last census, it had fallen to less than 12,000,000 pounds, valued at about $600,000. Its area of cultivation was only 16,042 acres of which Kentucky, which has always been the principal hemp state, had 14,107. Missouri, Tennessee and Pennsylvania, which at one time were heavy producers, had completely abandoned its cultivation.

Flax growing, for textile purposes, has still further fallen into abeyance. In 1869 27,000,000 pounds were produced, in 1889 only 241,000 pounds, while, in 1899, the production was so small that the census bulletins, otherwise so complete, give no information concerning it. It appears, however, that some flax fibre is still produced in Michigan, but, as a general thing, the cultivation and preparation of flax are considered too costly, and the several linen factories of the Eastern states import their raw material, despite a heavy impost.

In one way, however, flax is still prominent among the agricultural resources of the United States, and has even exhibited striking development of late. But it is now cultivated for the seed, not for the fibre. The high prices recently obtaining have led to increased sowings, so that we now see 2,081,297 acres under flax in place of the 1,272,758 acres of ten years ago. In fact, Russia is the only country producing more flax than the United States, the two other great producers, the Argentine Republic and British India, being far outdistanced by both Russia and the United States. In France, even at the most prosperous period — about the middle of the nineteenth century — the area under flax never exceeded 250,000 acres, while today it is only about half as large as that. In Russia flax is grown chiefly for the fibre, so that the United States ranks first among flax seed producers, providing, with approximately 68,500,000 bushels, nearly 29 per cent of the world's supply, Russia coming next. The American yield, I might add, is almost double what it was ten years ago.

Fifty years ago flax was grown chiefly in the states bordering on the Ohio River; but like so many other cultures its centre of production has moved steadily westward, until it is now found in Minnesota and the two Dakotas (the coldest states in the Union), which have an area of about 1,650,000 acres under flax, or nearly

four-fifths of the total acreage. In fact, no state east of the Mississippi produces a noticeable quantity of flax today. At best, it is not a profitable culture, the yield, in the United States, being only at the rate of 9.5 bushels per acre, worth 98 cents per bushel or $9.31 per acre. On the other hand, it does not put the cultivator to any great expense. The seeds are largely utilized in the manufacture of oil. In 1899, the total value of the exports, seed, oil, etc., amounted to $8,000,000, while the value of the imports was quite insignificant.

The principal oleaginous plant in the United States is, however, not flax but cotton. Relatively speaking the transformation of cottonseed into oil is a development of recent years, for altho the first cottonseed oil factory was established at Natchez so long ago as 1834, it was some time after the Civil War before the possibilities of the industry were recognized. Indeed, so far from being useful, the seed constituted a serious embarrassment to planters and ginners, who did not know what to do with the enormous accumulations left on their hands. Whenever possible it was thrown into the sea or a river; otherwise it was allowed to rot where it lay. All this is changed today. Figuring on the basis of the price paid to the growers, the 4,566,000 tons of cottonseed gathered in 1899 represented a value of $46,000,000, which is more than 12 per cent of the value of the total cotton production. It is true that about 15 per cent of the total yield, or nearly 700,000 tons, is saved for planting, and that 1,450,000 tons more are retained by the planters, either as a fertilizer or for fodder. But the proportion so retained grows less every year, because it is recognized that the residue left after the oil is pressed out constitutes a fodder and a fertilizer superior to that provided by the untreated seeds.

For this reason it is probable that the infant cottonseed oil industry, which today utilizes more than half the seed,

or 2,400,000 tons, will thrive mightily and compete more and more vigorously with the products of other oleaginous plants. Its development is of especial significance to Great Britain, for a goodly quantity of cottonseed used to be exported to England to be worked over in that country; now it is found cheaper not to export this bulky material, and almost all the cottonseed oil used in the United States is of domestic manufacture, the home production for 1900 having been as much as 93,325,729 gallons. About half of the annual production is exported to supply different wants — to be utilized in the manufacture of soap and margarine, and when highly refined, even to be used as a comestible oil. More than 30 per cent is taken by the great packing-houses of the country. "It is mixed with beef fat," the "Report" informs us, "and sold as lard, or goes upon the market as a substitute for lard under the name of cottolene." Truly a precious plant, this cotton, yielding a product which may be substituted, as one desires, for the wool of sheep or the fat of swine! In 1899 the exports of cottonseed oil reached a value of $14,000,000 and those of cottonseed cakes of more than $11,000,000.

Corn is put to similar use, tho on a smaller scale. But the industry appears to be growing, there having been exported from the United States, in 1902, $1,300,000 worth of corn oil. Another oleaginous plant found in America is the peanut, which, in 1899, covered an area of 516,658 acres, as against 203,946 acres ten years earlier. It is grown chiefly in Virginia, North Carolina and Georgia (313,359 acres for the three states), but is also scattered through nearly all the Southern states. A great many peanuts, however, are consumed as comestibles, either in their natural form or as a butter, only a small portion of the annual yield being converted into oil.

Next to cotton the most important industrial product

of the United States, outranking even the oleaginous cultures, is tobacco, in the output of which the Republic leads the world, with 1,100,000 acres under cultivation. British India, which comes next, has only 900,000 acres, and every other country is far behind. Tobacco is indigenous to the United States and has always played an important economic role there. There was even a time when it served as money. "In 1621," says the "Report," "eleven women came from England to become wives of colonists and their transportation was paid at the rate of 120 pounds of tobacco. . . . In 1688 the exportation of tobacco amounted to 18,000,000 pounds, while three years after this the yield of Maryland and Virginia alone aggregated 36,000,000 pounds. In Maryland it was made legal tender in 1732 (at the rate of 1 penny per pound) for all debts, including customs dues and the salaries of state officers and ministers of the gospel." During the presidency of Washington, at the end of the eighteenth century, tobacco exports made up in total value 21 per cent of all exports, being exceeded only by flour.

According to the census of 1850 the tobacco crop amounted to 199,752,000 pounds; according to that of 1860, on the eve of the Civil War, it had reached 434,000,000 pounds. By 1870, as a result of that frightful struggle, it had fallen to 260,000,000 pounds. Ten years later it was 472,00,000 pounds, or little more than it had been in 1860. The census of 1890 did not advance it much — 488,000,000 pounds. But the census of 1900 carried the total to 868,000,000 pounds. These figures, the "Report" admits, are subject to correction, and particularly in respect to the year 1890. The Treasury Department, which keeps an account of the output for revenue purposes, estimated the crop of 1899 (to which year, I would once more remind my readers, the census statistics of 1900 refer) at only 662,818,000 pounds. The difference between this amount and that given by

the census is, however, largely attributable to the fact that the dutiable tobacco is in the hands of the manufacturers and exporters, and is not estimated until after it has undergone a first treatment, consisting chiefly in desiccation, whereby it loses from 15 to 20 per cent of the leaf weight by which the growers estimate it. This being the case, it is clearly evident that the Treasury statistics should be much lower than the figures arrived at from the growers' reports. Moreover, a little tobacco, supposed to be, however, not more than ½ per cent of the yield, escapes taxation through being consumed by the growers or sold to their neighbors. For the crop of 1889 the Treasury Department estimated a yield of 555,000,000 pounds, and, for that of 1879, 433,000,000 pounds. This would mean an increase of only 50 per cent in the last twenty years, or of 20 per cent in the last ten years. But this, in itself, is a remarkable showing. I give below, according to the census of 1900 (the figures of which may be accepted as more accurate than the foregoing) the area under tobacco, the production, and the value of the yield, in each of the principal producing states:

	Area (In thousands of acres).	Yield (In thousands of pounds).	Value (In millions of dollars).
Kentucky	389	314	18.54
North Carolina	203	127	8.04
Virginia	184	123	7.21
Tennessee	72	49,2	2.75
Ohio	71	66	4.86
Maryland	42	24,6	0.44
Wisconsin	33	45.5	....
Pennsylvania	28	41,5	2.96
South Carolina	26	19,9	1.30
New York	11	14	1.17
Connecticut	10	16,9	3.07
Indiana	8	6,9	0.45
Total for the United States	1,101	868	56.99

This shows that the group composed of the three contiguous states of Kentucky, North Carolina and Virginia, contains nearly three-quarters of the area under tobacco, and produces nearly three-fifths of the total yield, as regards both weight and value. Weight and value, however, differ widely according to the region of cultivation. A pound of tobacco, the " Report " tells us, is worth from 2 cents to $2. Confining our analysis to the principal producing states, we find that the general average is 788 pounds per acre, and that this average varies from 628 pounds in North Carolina to 1,402 pounds in Connecticut. Like the latter, Pennsylvania, Wisconsin, New York, and Ohio show returns well above the general average. Kentucky has an average of 817 pounds to the acre, but the other Southern states, whose methods of cultivation are inferior to those of the North, are below the mean. In Connecticut a pound of leaf tobacco is worth 18 cents; in no other of the principal producing states is a pound worth more than 8 cents. Indeed, the majority show a value of only 6 cents, the general average being 7.

Of the 5,739,000 farms in the United States tobacco is grown on 308,317, which have an average of 3½ acres under cultivation. The average monetary return per acre under tobacco is high — $51.74. In Connecticut it rises to $300; in Kentucky it is $48.19, and in Virginia and North Carolina $39.11. But it is an expensive culture, demanding the greatest care, much labor, and free use of fertilizers, and exhausting the soil rapidly. Indeed, the differences in the weight and value of the yield are due as much to the methods of cultivation pursued as to the varieties grown. It might be added that there are many varieties. Some are light and lemon yellow in color, some are strong and dark. Some are especially grown for smoking, others for snuff, and still others for chewing, a practice prevalent among Americans and especially in the West.

But we cannot go into details regarding the numerous kinds of tobacco found in the United States. Suffice it to say that the number of cigars manufactured passed from 4,288,000,000 in 1890 to 6,176,000,000 in 1900; that of cigarettes from 2,505,000,000 to 3,258,000,000; and the quantity of snuff from 9,434,000 to 13,805,000 pounds — a truly remarkable increase.

Great quantities are exported. Of the yield of 1899 nearly half the production — to be exact, 305,000,000 pounds — was shipped abroad. On the other hand, nearly 21,000,000 pounds were imported during the same year, the importations coming chiefly from Cuba. Of the exports, 29 per cent went to Great Britain, 19 per cent to Germany, 11 per cent to France and 9 per cent to Italy. England is not only the heaviest purchaser; she is also the most discriminating. Austria comes next, then Italy and then France. In regard to our own country, I find an interesting remark in the "Report": "Formerly the French government took the best heavy-bodied tobaccos of Virginia, but since the Regie contract system has been introduced, the quality of the leaf used has been gradually lowered." As French consumers know to their cost, this has not prevented a recent increase in the price of Maryland tobacco, which in great measure comes from Virginia. The situation is indeed edifying.

We have yet to consider one of the most valuable industrial and alimentary commodities — sugar. In this article, however, we find the United States occupying far from a foremost place. So rich and progressive is the country, this at first glance may seem surprising. But the reasons are not difficult to find. As is well-known, the production of sugar-beet constitutes a profitable industry in Europe. But the sugar-beet is necessarily a product of intensive cultivation, and hence has not the same *raison d'être* in America, a new country of extensive cultivation. In regard to sugar-cane, it need

only be said that a very small section of the United States is suitable for its production. Politically, too, conditions militate against the development of the sugar industry. It is interesting to learn that the sugar question has been almost as heated a subject of controversy in the New World as it is in the Old. On the one hand, the planters of Louisiana endorse the bounty principle with the heartiness of our Northern sugar-beet growers; on the other, the protective system, under which the American sugar trust has built itself up, has become an object of sharp criticism. It has been partially breached by the admission, duty free, not only of Hawaiian sugar, to which a preference has long been extended, but, also, since the war with Spain, of Porto Rican sugar; and by the reduction of the duty on Cuban sugar.

Whatever the reason, the total area under sugar was, in 1899, only 855,055 acres, an extremely small fraction of the total area of crop-bearing land. Of this acreage, 452,673 acres — nearly half the total — were under sugar-cane, 293,152 acres under sorghum-cane, and only 110,170 acres under sugar-beet. Louisiana was the only state having extensive sugar-cane plantations — 275,000 acres — and its yield was not more than 11 tons of cane per acre, a quarter of which had to be reserved for planting. As against this, Hawaii, with only 65,687 acres of sugar-cane, produced 34 tons to the acre and reserved an extremely small proportion for planting. The other states bordering on the Gulf of Mexico, as well as Georgia, the Carolinas, and Arkansas, grow some sugar-cane, but the yield is always poor. Decidedly, the continental territory of the United States is not well adapted to this culture. On the other hand, it appears capable of remarkable development in the Hawaiian Islands.

Sorghum-cane is grown chiefly in Texas, Kansas, Missouri, Kentucky, Tennessee and several other states of the Centre and South. Some maple-sugar is produced

in New York, Vermont, Pennsylvania and a few other states. The cultivation of the sugar-beet is, as I have said, very much neglected. The centres of production are California and Michigan, each of which has about 25,000 acres under cultivation, producing, respectively, 320,000 and 200,000 tons of sugar-beet, and Nebraska and Washington, with about 7,500 acres apiece.

To sum up: There was produced in the United States, in 1899, a little less than 400,000 tons of cane sugar (of which 250,000 tons came from Hawaii) and about 75,000 tons of beet sugar. It is impossible to give accurate figures respecting sorghum and maple-sugar, for the reason that both are left largely in the syrup state and are consumed, in this form, by the producers. In 1902, I might add, the United States was obliged to import no less than 1,400,000 tons of sugar.

Will this situation change? Certainly many sections of the country have soil suitable for the cultivation of the sugar-beet, which will also be of service in the way of facilitating crop rotation on that day, perhaps not far distant, when American agriculture is compelled to become more intensive. But, having at its doors, and more or less dependent upon it, such islands as Cuba and Porto Rico, to say nothing of Hawaii and the Philippines, it is probably there rather than in its home territory that the sugar of the United States will be produced. I remember having read, some years ago, in an American magazine, an article, entitled "The Revival of Cane Sugar," in which it was claimed that the growing of sugar-cane would once more become an important industry through the efforts of the United States. The Americans are assuredly paving the way for such a revival. Already Porto Rico is being covered with plantations. So that European producers will do well to be on their guard. In this field where their supremacy is still uncontested, they may soon be called upon to encounter the

sharp competition of the American spirit of initiative and organization, if not the competition of the American soil itself.

Finally, a subsidiary branch of agriculture found prospering in the United States is the cultivation of the products of the garden and orchard. Unfortunately we cannot spare the space to study this most interesting subject in its infinite details. It must suffice to say that while vegetables and fruits are grown in almost every section of the country, they are especially cultivated in the neighborhoods of towns and cities, the natural centres of consumption. Of late years, however, thanks to improved methods of transportation and preservation, a greater decentralization is observable, and we find the production of vegetables and fruits prominent in the economic life of California and certain Southern states, which ship their products far and wide, not only in the form of preserves but in their natural condition. The tireless ingenuity of the Americans has found a profitable field for its exercise in inventing means whereby these valuable but perishable commodities may be carried great distances without coming to harm. So long ago as the middle of the nineteenth century, the growers of Virginia began sending their early fruits and vegetables to New York City by sea. But it was impossible to transship any considerable quantity, for it was necessary to place the boxes and baskets on the deck of the carrier in order to ensure sufficient ventilation for the thirty-six hours' voyage. In 1874 peaches were sent by rail, for the first time, from Mississippi to New York. The cars used were ventilated by numerous openings covered with iron wire. Such cars are still employed for short hauls or in carrying fairly hardy vegetables. But for long distance transportation of very perishable commodities, refrigerator cars are used today. The "Report" says that as many as 60,000 refrigerator cars — or 5 per cent

of the total rolling stock — are in circulation over the lines of the railways of the continent, the railways of the United States, Canada and Mexico. Besides being impressive, this figure is of direct value to us in showing that by following the example of the Americans we could improve our methods of transporting a large number of food products and at the same time render a great service to our agriculturists. It should be added that only a small fraction of this enormous total is utilized for carrying fruits and vegetables. The transportation of fresh meat, beer, eggs, butter, milk, cheese and various other commodities that spoil quickly gives employment to the remainder. It has been found possible to carry in safety for at least ten days the most delicate fruits which, in addition, are discharged into cold storage warehouses so soon as they arrive at their destination. Thanks to this marvelous system the earliest fruits and vegetables may be shipped to the Northern states not only from Virginia, Maryland and Delaware, but even from California, Florida, Louisiana and Texas.

The value of the preserved fruits and vegetables prepared in the United States rose from $17,000,000 in 1880 and $30,000,000 in 1890, to $56,000,000 in 1900. To this should be added the value of the pickles and of those highly seasoned but strangely monotonous sauces found on all English and American tables. America, it has been said, is a land of only one sauce but of one hundred religions. The pickle and sauce value was $2,500,000 in 1880, nearly $10,000,000 in 1890, and all of $21,500,000 in 1900.

Among the fruit industries there is one which in France is of such importance that we often exaggerate its place in the agricultural activity of the world. This is viticulture. As a matter of fact, outside of France, Italy, Spain and Portugal the cultivation of the vine constitutes only a secondary branch of agriculture. If it is still

of some importance in Austro-Hungary, Roumania, Greece, Switzerland and Germany, it is almost a negligible quantity everywhere else. Of "new" countries, Argentina, Chile and Cape Colony are the only ones in which it amounts to anything. And, unfortunately for us, in the countries in which little wine is produced hardly any more is drunk.

So far as the United States is concerned, little need be said about viticulture. In the volumes relating to agriculture the "Report" does not even give the quantity of wine produced. It presents only a few facts relating to vineyards and, for the rest, refers the reader to the statistics bearing on industry proper. In which it is perfectly correct, since by far the greater portion of the wine extracted in the United States is made by wineries which buy their grapes from the growers. It is somewhat surprising, however, to find that not even the number of acres planted in vines is given — merely the number of vines. In fact, out of the 1,600 pages devoted in the "Report" to agriculture only a single page has to do with the cultivation of the grape. From this page it appears that there were in the United States, in 1899, 182,000,000 grape vines, of which 90,500,000 were in California, 29,500,000 in New York, nearly 14,000,000 in Ohio, and from 6,000,000 to 3,000,000 in Kansas, Michigan, Pennsylvania, Oklahoma, Missouri and Illinois. The total weight of the grapes produced was 600,000 tons, of which 375,000 tons came from California, 112,000 tons from New York and 36,000 tons from Ohio. These figures include table grapes. According to the statistics of the Department of Agriculture, the wine output averages annually between 22,000,000 and 33,000,000 gallons. In 1901 it attained the exceptional amount of 44,000,000 gallons. Perhaps viticulture will be further developed under the influence of the increasing demand due to the presence of the large numbers of South-

ern European immigrants who have latterly arrived. But in any event, it does not seem probable — although I have tasted some most agreeable California wine — that the United States will ever compete seriously with us as a wine exporter. Unluckily, it does not seem any more probable that, except for champagne, it will ever become one of our best customers.

CHAPTER VII

IRRIGATION AND THE OPENING UP OF THE WEST

One of the most important problems to be solved by western peoples when they leave a region of humidity, of abundant and frequent rains, for the purpose of colonizing new lands, is the development of sections wherein cultivation cannot ordinarily be practiced by reason either of insufficiency or uneven distribution of the annual rainfall. Such sections are limited neither in area nor in localization. In the Old World almost all of North Africa, parts of South Africa, Anterior and Central Asia, and even a portion of India are thus conditioned. Similarly conditioned in the New are those western regions of the United States lying between the one hundredth parallel of longitude and the Cascade and Sierra Nevada Mountains; the high tablelands of the Andes and parts of the Pacific Slope of Chile and Peru; a large portion of the Argentine Republic; and, finally, in Oceania, almost the whole of Australia. The importance of the problem posited hereby is self-evident. But the peoples who today are in the forefront of civilization are ill prepared to solve it.

The ancients were better equipped. Living in countries, like Greece and Italy, which were liable to long summer drouths and in which many products could be raised only by the aid of irrigation, they had learned the art of regulating the water supply and naturally applied their knowledge to these other southern countries whither their energy led them. Today, however, the principal colonizing nations occupy the North-West and the Centre

of Europe highly favored regions where the rainfall, if it is not always copious, is always regular, and where cloudy skies prevent too rapid evaporation. France, for her part, has only seven or eight departments in the Southern zone, and none of these is in a really arid region. Thus it has come about that the art of irrigation has fallen into desuetude, and that in this respect the colonizers of the modern world are decidedly inferior to the colonizers of antiquity. But unless many colonial possessions are to remain undeveloped the art must be relearned. It is especially necessary for us in France to acquire it, and it is therefore particularly instructive to ascertain what has been done by the Americans in those vast Western expanses to which they have given the significant appellation, "the dry lands."

But before proceeding, it will be well to make some general observations. In the first place, it should be noticed that quite frequently irrigation is only a question of remedying, by the utilization of surface or subterranean waters, an uneven distribution of the rainfall. Sometimes, for instance, nature brings into an arid region the rain that falls in abundance elsewhere, doing this by conducting it through a great river whose upper basin is in the land of heavy rains. Thus the Nile brings into Egypt the rains of the Eastern Soudan. The case is the same with the Niger, called on the old maps, appropriately enough, the "Nile of the Negroes." The upper river and its higher tributaries receive abundant rains which are carried by the middle river through the South-Western extremity of the Sahara, fertilizing a valley which should one day yield not a jot to Egypt in point of productiveness. Coming from regions of periodical rains, rivers of this kind are annually in flood, and thus render man's task easy, for he has only to regulate the beneficent overflow.

Sometimes, again, the country awaiting development

is traversed, not by powerful rivers flowing from distant regions of heavy rainfall, but by streams descending from mountainous regions, where the rain-bearing winds are checked and where humidity is stored up either in the form of glaciers or in the form of copious snows. This is the condition obtaining in Eastern Turkestan. When spring comes, that is to say, precisely when the period of drouth begins, the snows melt and the streams swell. If the mountains are high enough to carry perpetual snow the flow will continue, rendering irrigation possible throughout the summer. If they are less elevated the flow is more or less speedily exhausted and the streams lower anew. The one thing needful is that the spring floods last long enough to supply the irrigation works with sufficient water to bring the crops to maturity.

When this prime desideratum is lacking, when the streams traversing a country subject to drouths descend from mountains lying so low that the snows disappear with the end of winter, or soon thereafter, extended irrigation works are not possible, for the streams lower rapidly, often to the vanishing point, at the very moment when they are most needed. Recourse must then be had to immense reservoirs, the first cost of which is extremely burdensome and the presence of which is sometimes dangerous to the community. Nor can it be said that they meet the need in a thoroughly satisfactory way. Unfortunately, our colonies in North Africa are thus situated, and their condition is aggravated by the fact that their mountains are largely without trees and so much the less capable of retaining rain and snow.

Finally, water available for fertilization may sometimes be found not on the surface but below ground, whither it has percolated and where it occasionally forms a vast subterranean river system, draining enormous expanses, and thus attaining a considerable volume in spite of the paucity of the rainfall received by the surface.

Wells, ordinary or artesian, may be employed to advantage in these circumstances. The services rendered by the subterranean waters of the Algerian Sahara form an excellent case in point.

The American "West" falls under the second of the categories I have just described. It is traversed by rivers coming not from regions of heavy rainfall but from high mountains which, owing to their altitude, receive more of atmospheric precipitation than the plains and tablelands roundabout them. These mountains, the Rocky Mountains, have an altitude little inferior to that of the Alps, and boast several peaks of more than 12,000 feet. But, since the greater portion of the United States is situated in a more southerly latitude than are the Alps, it is only at the northern extremity, in the neighborhood of the Canadian border, that glaciers and perpetual snow are found, and even here for only a very limited area. So the spring flood of the rivers that fall from these mountains is not maintained throughout the summer. Indeed, it expends itself very quickly in the southern region, in Arizona, in New Mexico, and even in Colorado, and some years not a few irrigation canals remain completely dry.

I have already had occasion to define the arid zone. But I would remind the reader that by it is meant all that portion of the country wherein the annual rainfall is less than 20 inches. It will at once be pointed out that the rainfall of Paris is little more and that a portion of Champagne receives even less rain. But in the case of both Paris and Champagne the rainfall is more evenly distributed than in the case of the arid zone of the American West. From the one hundredth parallel of longitude to the Cascade and Sierra Nevada Mountains, which almost exactly connects its boundaries, this zone covers nearly two-fifths of the total territory of the United States, exclusive of Alaska and the accessions consequent upon

the Spanish-American War. Eight states — Montana, Idaho, Wyoming, Colorado, Utah, Nevada, Arizona and New Mexico — are entirely contained within it. The three states bordering on the Pacific — Washington, Oregon and California — are also contained within it for at least half their total area, for which reason they are included in the category of "arid" states, although their remaining territory is well watered. On its eastern side the zone embraces nearly half of the two Dakotas and Nebraska, and a by no means small portion of Kansas, Oklahoma and Texas. These six states are referred to by American authors as "semi-arid" or "sub-arid" states.

Colonization did not invade the "dry lands" much before 1870. At that time the eleven states comprised therein had only 990,000 inhabitants, 560,000 of whom were in California, whither the discovery of gold had drawn many from the East about the middle of the nineteenth century. In 1880 the population of the arid zone was still only 1,767,000, with but 903,000 outside of California. In 1890, however, it had grown to 3,102,000, with 1,894,000 outside of California, and, finally, in 1900 the region boasted 4,091,000 inhabitants, with 2,606,000 inhabitants in the ten states and territories other than California. In proportion to its area, it was still sparsely settled, the rural population numbering only 2,430,000 souls, or but 1,723,000 if California be left out of the reckoning. And it should be added that this extra-urban population is itself far from being a rural population, for a large part of it is to be found in the mining camps scattered throughout the tablelands of the Rockies.

Feeble tho this human effective force may seem, it has already obtained some astonishing results. Not content with grazing on their barren ranges some 8,500,000 cattle and 33,000,000 sheep — animals requiring comparatively little attention — the colonists of the arid states

have irrigated no less than 7,539,545 acres, or an area equal to that of five French departments, and in one year alone (1899) have grown on the irrigated soil crops worth $86,860,491.

The rapidity with which irrigation works have been extended is perhaps the most remarkable feature in the opening up of the West. At any rate it is one of the features on which the Americans themselves lay emphasis. Live-stock raising is, of course, an important industry, but conducted along very extensive lines, as it necessarily must be in the arid zone, its development, if far from being at an end, is obviously limited. It can give employment only to a restricted number of people, who, through the necessity of frequent changes of pasture, are often condemned to a semi-nomadic existence. Solely through the development of agriculture proper, can a dense population be brought into the region. But in the "dry lands" agriculture can be practiced hardly anywhere except on irrigated land. In fact, comparing, according to the figures of the census of 1900, the area of irrigated land with that of the improved land of the region, it is seen that in Nevada, the state of most unfavorable climate, 88 per cent of the improved land is irrigated land, in Wyoming 80 per cent, in Arizona 72 per cent, in New Mexico 62 per cent, and in Utah 61 per cent. In Montana, which possesses some fairly humid districts, the proportion is still 54 per cent; but in Idaho, the north-western section of which comprises high valleys over which the clouds from the great ocean condense, it falls to 43 per cent. The three Pacific states, half of the area of which receives abundant rainfalls, have a still lower proportion, the figures being 12 per cent for California and Oregon and less than 4 per cent for Washington. In these states, nevertheless, and particularly in California, the area of irrigated land is still considerable.

If we turn from area to a comparison of the value of the crops obtained from irrigated land with the value of the crops obtained from all the land of the West, we obtain a still better idea of the importance of irrigation. Of the $2,863,000 given as the total value of the Nevada crops of 1899, fully $2,853,000 worth came from irrigated land. In Colorado, which with the exception of the Pacific states is the principal agricultural state of the arid zone, $15,100,000 worth of products, out of a total crop value of $16,860,000, was derived from irrigated lands — a proportion of fully 90 per cent. In Arizona, Utah and Wyoming the proportion was also at least 90 per cent. In Montana it was 70 per cent and in Idaho 60 per cent, while in California, altho only about an eighth of the area of improved land is irrigated, the value of the products of the irrigated land amounted to more than a third of the total crop value — $33,000,000 out of $93,000,000.

Clearly the crops grown on irrigated land have a much higher value than those grown in the same region on non-irrigated soil. This is partially attributable to the fact that the most profitable products are cultivated by the aid of irrigation; but it is due still more to the increased abundance of the yield from land thus treated.

The following table will give an idea of the distribution of the irrigated land according to the different varieties of products grown:

ACREAGE AND VALUE OF IRRIGATED CROPS IN 1899.

	Acreage (In thousands of acres).	Value (In millions of dollars).
Hay and forage	3,666	34.8
Cereals	1,400	14.3
Vegetables	168	9.6
Fruits	251	10.0
Miscellaneous	227	15.6
Total	5,712	84.4

It will at once be noticed that this total of 5,711,965 acres is less than the total area of the irrigated land. The remaining 1,551,308 acres comprise in part land on which cattle were pastured and in part land which was not properly irrigated by reason of the exceptional drouth of the summer of 1899 and which hence failed to yield crops.

The states possessing the largest area of irrigated land are Colorado (1,604,213 acres), California (1,293,366 acres) and Montana (951,154 acres). These three states together possess more than half of the total area. Then come Utah, Wyoming, Idaho and Nevada, with from 500,000 to 600,000 acres apiece.

The number of irrigators in the arid zone was 102,819 in 1899 as against 52,584 ten years earlier, an increase of nearly 100 per cent. The area of irrigated land increased by more than 100 per cent during the same ten years, passing from 3,564,415 to 7,263,273 acres. In California and Colorado, states of earliest colonization, the increase in land under irrigation was only 44 and 81 per cent respectively. A noticeable feature in the development of both these states, but especially in the development of California, where irrigation is utilized chiefly for the cultivation of fruits, is a tendency to partition the irrigated land among a very large number of cultivators. It is possible that a similar tendency will ultimately manifest itself in the newer states, altho they are less adapted to fruit growing than is California, whose magnificent orchards form one of the principal sources of her wealth.

Taken all in all, however, forage is unquestionably the most important product of irrigation. The production per irrigated acre is 1 4-5 tons as against barely 1 2-5 tons for the general average of the United States. Lucern-grass is a prominent forage growth of the irrigated region. In the production of cereals irrigation

plays an infinitesimal part. In not a few districts cereals are grown simply because the difficulties attending transportation make them an expensive import. It should be noted, however, that in Colorado, which has the heaviest irrigated cereal production, an irrigated acre yields about 48 bushels of wheat, or more than the average yield per acre in France. Indeed, the general average in the United States is only from 28 to 30 bushels per acre, and in that same state of Colorado the few acres of non-irrigated land under wheat yield only about 13 bushels per acre.

As a rule, the irrigated farms are fairly large, averaging, according to the "Report," about 70 acres of irrigated land, each acre being worth on an average $42.53 — a figure much superior to the average acreage value of the United States as a whole. In California the value of an irrigated acre averages as high as $89.19. The yield per irrigated acre is worth $14.81 for the total acreage of the arid zone and $28.47 for California. The cost of labor comes to $8 per acre, exclusive of the average first cost of water supplied by irrigation systems.

Curiously enough, the cost of the first establishment of the existing systems, barrages, canals, etc., is not so very high, aggregating, according to the "Report," only $64,289,000. The remarkable thing about this, says the "Report," is that it is 30 per cent less than the value of the crops grown on irrigated land. In only three states, New Mexico, Arizona and Wyoming, does the first cost exceed the value of the crops produced. Everywhere else the reverse obtains, and particularly in California, thanks to the value of the fruit grown on irrigated land. This proves that in the United States irrigation systems are neither very extensive nor very expensive. The "Report," moreover, puts itself strongly on record in favor of the installation of low-priced systems by local associations as against the installation of expensive works

by big corporations. In connection with this matter the few lines wherein the history of irrigation in the United States is summed up, are instructive. After recalling the fact that the Mormons who settled on the shores of the Great Salt Lake, about the middle of the nineteenth century, were the pioneer irrigators, the "Report" says: "In 1870 there were in all probability not more than 20,000 acres under irrigation in the whole United States. From 1870 to 1880 was an era of rapid development of small ditches constructed by individuals and associations of farmers. At the end of that period there were probably 1,000,000 acres under irrigation. In the decade 1880 to 1890 occurred the 'boom' of speculative enterprise in irrigation canals. Large sums of money were obtained for irrigation works by the sale of stocks and bonds, and great enterprises were projected, canals of upward of 100 miles in length being planned and in some cases built. Nearly all of these failed of financial success and altho they have aided in the extension of irrigation they have not enriched the investors. . . . In 1889 there were 3,631,381 acres irrigated. During the following decade the irrigated acreage doubled in extent. This has been due rather to the extension and enlargement of the many canals existing in 1889 than to the construction of new and large systems of irrigation."

Two lessons may be drawn from this. First, that in irrigation the construction of very large and expensive systems is absurd, since their first cost of establishment is so heavy that they reduce materially the benefits to be derived from the water they supply. Second, that it is wrong to imagine, as seems to be the current belief in Europe, that nothing is done in the United States save on a large scale, by trusts and by millionaires. The trusts and the millionaires, for that matter, are far less numerous than is commonly supposed.

The fundamental cause of the impressive development

of the United States may be briefly stated. Added to the immense riches of a still virginal soil and sub-soil, there exists a two-fold spirit permeating all classes of the American people — a spirit, on the one hand, of association and organization; on the other, of individual progress, energy and activity. The success of the great majority of American agriculturists is due in no small measure to the possession of these virile qualities. And we shall see their powerful effects even more clearly when we turn to examine the prodigious industrial development now taking place in the United States.

PART THREE

INDUSTRIAL AMERICA

CHAPTER I

THE GENERAL CHARACTERISTICS OF AMERICAN INDUSTRY

The United States is today an industrial rather than an agricultural country. Agriculture, of course, still plays a very prominent part in the economic activities of the Union, affording occupation to the largest number of people and leading all else in point of foreign trade, supplying nearly two-thirds of the exports. But industry now gives employment to a greater aggregate of capital than does agriculture, and also yields an output of higher value; so that, if until recently the cultivators rather than the manufacturers of the Old World have had occasion to dread the competition of the New, such is no longer the case, and will be still less the case in the future.

It is, indeed, pretty safe to say that the agricultural competition of the United States, so far as concerns the generalty of products, has already reached its maximum. Virginal and fertile lands are becoming scarce, and, since the population is continuing to increase rapidly and to assume a more and more urban character, it would seem possible neither for the price of agricultural products to fall nor for their output to increase more rapidly than the consumption. Consequently the surplus available for exportation should at best increase very little.[1]

[1] I am here speaking, of course, in a general way, and of the principal articles of exportation, such as wheat, cotton and meat, the exports of which, it seems to me, should for the future increase much more slowly than has been the case in the past. Certain commodities of recent development — such as oils, and particularly cotton oil, which has lately been exported in large quantities; sugar, from the transmarine possessions of the United States; rice, which is beginning to be extensively cultivated in the South, and sundry other

In fact comparing the country's foreign trade of today with its foreign trade of twenty years ago — and in order to avoid the influences exercised by special conditions obtaining in any single year, taking the averages of the three years 1880–82 and of the three years 1900–02 — it will be found that while the total export value rose from $814,000,000 to $1,396,000,000, a gain of 72 per cent, the agricultural export value rose only from $656,000,000 to $877,000,000, a gain of but 34 per cent. As against this the export value of manufactured goods passed from $117,000,000 to $416,000,000, an advance of 250 per cent.[1] Thus the expansive ability of American industry would seem to be superior to that of American agriculture.

The industrial development of the United States is, of course, more recent than that of the advanced countries of Europe — England, France, Germany. So long as the American colonies were linked to the mother country the prohibitions of the Mercantile System operated against manufacturing enterprise. And even after independence had been attained agriculture for a long time enjoyed an absolute supremacy, relegating industry to second place, as usually happens in new countries where there is small capital, where a restricted market offers only precarious openings, and where the development of a virginal soil, the exploitation of the forests, and the garnering of natural, uncultivated products promise large profits at a small outlay and consequently dissuade men from the heavy investments necessary to the conduct of manufacturing establishments. "It seems probable," says the "Report," "that until about the year 1850 the bulk of general manufacturing done in the United States, was carried on in the shop and the house-

articles of relatively secondary importance — may prove exceptions to the general rule.

[1] The remaining exports are composed of mineral, forest and fishery products. The figures quoted are taken from the Statistical Abstract of the United States for 1902.

hold, by the labor of the family or individual proprietors, with apprentice assistants, as contrasted with the present system of factory labor, compensated by wages and assisted by power."

This does not mean that the concentration of certain industries in large establishments had not begun before 1850. This movement, says the "Report," had started with the War of 1812, which interrupted relations between the United States and England. In the textile industries it was rapid. In 1823 was founded Lowell, the first of the purely manufacturing cities which today make Massachusetts a second Lancashire. But at that time Massachusetts did not have a veritable working-class population. Michael Chevalier, who visited Lowell about ten years after it came into existence, gives, in his "Letters on North America," an almost idyllic description of this industrial Salentum where side by side with large factories he found well kept boarding-houses in which, under the watchful eye of respectable matrons, lodged factory girls, daughters of farmers living in the vicinity. These factory girls, it appears, would secure a small reserve fund of money by working some years in the mills and would then return to the fields.

This is the first stage in the evolution of the factory system. It can be seen today, as I myself have seen it, in Japan and Russia, and it could have been seen, during the last quarter of the eighteenth century, in England where dormitories were built in connection with the workshops for the convenience of the employees who had been recruited from the country for a term of years, or of months.[1]

But visiting Lowell sixty years after my grandfather

[1] These Russian and Japanese sleeping-places, the appearance of which is by no means prepossessing, are far inferior to the Lowell boarding-houses described by Michael Chevalier. It is also to be observed that contemporary authors give doleful accounts of the eighteenth century English barracks in which were huddled together the children recruited for factory labor, and of the treatment these unfortunates received.

visited it, I could find no trace of the houses of which he wrote. The first stage had long before been passed in America. From 1830 to 1850 the development of the factory system was rapid. In 1850 Massachusetts could show 1,288,000 cotton spindles as against 340,000 in 1830. In 1860 she had 1,688,000. Between 1850 and 1860, if not in the preceding decade, corporations were established for the manufacture of iron, steel, leather, etc. According to the distinguished English statistician, Mulhall, the products manufactured in the United States rose from an aggregate value of $268,000,000 in 1820 and $467,000,000 in 1840 to $1,907,000,000 in 1860, closely approaching the value of the industrial output of France and Germany, and far outdistanced by England only.

Since 1860 the industrial growth of the United States has been little short of miraculous. I cannot give a better idea of it than by extracting from the "Report" a brief table summing up the industrial situation at each census, and very clearly bringing out the extraordinary progress achieved:

GENERAL STATISTICS OF AMERICAN INDUSTRIES IN 1860, 1880, 1890 AND 1900.

(ALL VALUES IN MILLIONS OF DOLLARS.)

	1860.	1880.	1890.	1900.
Number of establishments.....	140,433	253,852	355,415	512,339
Capital	1,010	2,790	6,525	9,835
Salaried officials, clerks, etc....	.....	.....	461,009	397,174
Salaries	.....	.....	392	404
Wage-earners, average number.	1,311,246	2,732,595	4,251,613	5,316,802
Total wages	379	948	1,891	2,329
Male wage-earners, 16 years and over	1,040,349	2,019,035	3,327,042	4,116,610
Wages	.....	.....	1,659	2,021
Female wage-earners, 16 years and over	270,897	531,639	803,686	1,031,609
Wages	.....	.....	215	282
Child wage-earners, under 16 years	.....	.....	120,885	168,583
Wages	.....	.....	17	26
Miscellaneous expenses	.....	.....	631	1,028

	1860.	1880.	1890.	1900.
Cost of materials used.....	1,032	3,397	5,162	7,348
Value of products, including custom work and repairing..	1,886	5,370	9,372	13,004

A single glance will suffice to show how rapidly the country's industries have grown since the middle of the past century, since twenty years ago, even since ten years ago. When their growth is compared with the industrial growth of other nations the marvelous industrial expansion of the United States will be still more readily appreciated. During the past ten years no country has made such a complete inventory of its resources as the United States has done in its census, and for none can such circumstantial and approximately accurate statistics be obtained. But it is certain that industrial development has been far slower in Europe. Mulhall, who has just been cited, attempting to appraise the total value of manufactured goods, estimates that from 1860 to 1894 it passed in Great Britain only from $2,808,000,000 to $4,263,000,000; in France only from $2,092,000,000 to $2,900,000,000; in Germany only from $1,995,000,000 to $3,357,000,000; but in the United States from $1,907,000,000 to $9,498,000,000.

So far as concerns the latter country his figures are virtually the same as those of the census of 1890, for the value of the goods manufactured in America in 1894 was not much higher than the value of the output of 1890, by reason of the intervening industrial crisis which, dating from the beginning of 1893, caused a perceptible decrease in production and a sharp fall in prices.

To be sure, certain reservations, which I shall indicate and which have been noted by the "Report" itself, must be made in accepting the figures either of Mulhall or of the successive censuses. But it is none the less certain that the United States is today, and by far, the first industrial power in the world, just as it is the first agricultural power, and it does not seem too much to say

that its industrial strength, as expressed by the value of the output, has increased by five-fold from 1860, while that of Germany has only doubled, that of Great Britain has increased by but one-half, and that of France shows a still smaller increase.

I have just said that some reservations must be made in respect to the statistics quoted. To give an instance, it should be noted that the $13,000,000,000 stated as the value of the goods manufactured in the United States in 1900 includes a number of duplications. The "Report" does not overlook this, pointing out that "as the finished products of one branch of manufacture are constantly used as materials in other branches, in the ascending scale of modern industry, it follows that they are counted over and over again, swelling in this manner the total gross value of products. Thus, in the cotton manufacture, the product of the yarn mill manufacturing yarns for sale is the material for the cloth mill, and the product of the cloth mill is the material for the clothing manufacturer; so that by the time the aggregate is made the value of the yarn has been counted three times and the value of the cloth twice." The "Report" gives the following concrete illustration: Suppose the value of the yarn made in the mill is $10,000, that the value of the cloth made in the cloth mill — in which value is included the value ($10,000) of the yarn — is $15,000, and that the value of the clothing made in the clothing factory — in which value is included the value ($15,000) of the cloth — is $20,000; the total gross value of the products of the three establishments will be $45,000. "Yet," continues the "Report," "it is evident that the true value of these products is not $45,000 but $20,000, the value which would have been reported had these three operations of yarn making, cloth making and clothing manufacture been performed by one establishment."

How then are we to estimate the true value of the

goods manufactured? In the censuses of 1870, 1880 and 1890 an attempt was made to ascertain this approximately by deducting from the value of the manufactured output the value of the materials employed in the manufacture — which gave, for 1890, a value of $4,210,000,000. The "Report" for 1890 called this the net value of the products. But this method of calculation made the value of the output less than that of the raw materials which was, as the "Report" for 1900 points out, a statistical absurdity.

As a matter of fact, the sum obtained by thus deducting from the value of the manufacured goods the value of all the materials employed in their manufacture represents merely the value that has been added to these materials by manufacturing processes. To obtain the true net value it is necessary to add to the residue the value of the materials as they were when first brought to the factory. In order to obtain this valuation the census schedules of 1900 divided the materials into two classes: (1) materials purchased in a raw state (such as raw cotton, raw wool, raw silk, grain, cattle, ores, etc.); (2) materials purchased in a partially manufactured state (such as pig iron, steel, lumber, flour, cloth, etc.). Now, the cost of materials of the second class was reported on the schedules of other establishments, which had performed the work of partial conversion from the wholly raw state, as the value of their products. Therefore, the total of this cost represents the sum of duplications in the gross value of the year's products. In 1900 the value of the partially manufactured materials employed by American manufacturing establishments was $4,634,000,000. It follows that the net value of the output may be obtained by deducting this total from the $13,004,000,000 of gross value. The net value would thus be $8,370,000,000.[1]

[1] These figures, of course, are merely approximate. Were absolute precision sought weighty objections could be raised against this method of calculating net value. For one thing, it is impossible to establish a definite line of de-

I have attempted to follow the "Report" in this rather dry computation of the net value of American industrial products, because it shows what care should be exercised in handling statistics of this sort, and also because it is more profitable to compare the net value instead of the gross with Mulhall's estimates of the value of the products of the principal European countries. But even when reducing the value of the American output to $8,370,000,000, and admitting with Mulhall that the protective tariff of the United States has the effect of artificially increasing by 33 per cent the value of its manufactured goods (which seems to me an exaggeration, but which would nevertheless leave the real value of these goods above $6,000,000,000), it is evident that the United States still holds first place among the industrial countries of the world. For (from 1894 to 1900) England has shown only a feeble increase, while if Germany has to a greater extent developed her production in the course of the same period she is certainly far from having doubled it, and one would be extremely optimistic who should claim that the value of her output exceeds $4,000,000,000. So far as France is concerned everybody knows that her industries are making but slow progress. Moreover, in both the last named countries it should not be forgotten that a protective tariff is also partially responsible for high prices.

There can thus be no question of the industrial primacy of the United States, a primacy which she has held probably since an epoch midway between 1880 and 1890. Yet, curiously enough, the proportion of the population occupied in industrial pursuits is much less than the proportion of the population similarly employed in England,

marcation between absolutely raw materials and materials in process. Again, in deducting the value of materials used from the gross value of the finished product the manufacturer does not estimate the former at initial cost, but at this cost plus the costs of transportation and sale, and plus the profits taken by those through whose hands the materials have passed before coming to him. Fortunately, for the present purpose absolute precision is not required.

Germany or France. If, in the United States, there is much more capital engaged in industry than in agriculture, and if the value of the goods manufactured is much higher than that of the agricultural products — which is only $4,740,000,000, with a net value of less than $3,600,000,000 — there are many more people earning their living in agriculture than in industry. The following table showing the distribution of the American population according to vocation, during the three latest censuses, is not without interest:

NUMBER OF PERSONS, 10 YEARS AND OVER, ENGAGED IN GAINFUL OCCUPATIONS.

	In thousands		
	1880.	1890.	1900.
Agricultural pursuits	7,714	8,566	10,382
Professional service	603	944	1,259
Domestic and personal service	3,424	4,221	5,581
Trade and transportation	1,866	3,326	4,767
Manufacturing pursuits	3,785	5,678	7,086
Total	17,392	22,736	29,074

	Per cent.		
	1880.	1890.	1900.
Agricultural pursuits	44.3	37.7	35.7
Professional service	3.5	4.1	4.3
Domestic and personal service	19.7	18.6	19.2
Trade and transportation	10.7	14.6	16.4
Manufacturing pursuits	21.8	25.0	24.4
Total	100.0	100.0	100.0

In Great Britain, on the contrary, there were, according to the census of 1901, 9,000,000 people engaged in manufacture, 1,680,000 in commerce, and 2,460,000 in agriculture. Thus, absolutely as well as relatively, the number of people in Great Britain engaged in industry is much higher than the number of people so engaged in the United States, although the value of the goods manufactured by the former is not much more than half that of the goods made by the latter. Examining the

statistics more closely, it should be said, of course, that while the transportation business, which gives employment to a very large number of people, is classed in the American returns with commerce, it appears to be classed in the English with industry. But the number of people so engaged is assuredly much less in the British Isles than in the United States, which has a railway system seven or eight times as large. So that even were this element deducted from the industrial population the latter would still remain much larger in Great Britain than in the great republic in the New World.

Further, even if when thus corrected the statistics of the two countries are not exactly comparable by reason of secondary divergencies in the census schedules, we are perfectly justified in concluding from them that the work of an American workingman is, on the average, more productive than that of the British workingman, and, *a fortiori,* than that of any other workingman in the world. In connection with this matter it should be noted that, according to the statistics of the last few censuses reproduced above, the number of women and children employed appears to be proportionately less in the United States than elsewhere. Viewed from whatever standpoint this is a very happy condition of affairs, and undoubtedly aids materially in raising the average of productiveness. But the difference is too great to be accounted for simply by the numerical superiority of the male element in the working population. It can be explained only on the assumption that the American workingman works harder than the workingman of other countries, or that he receives more efficacious assistance from machinery, or that both these conditions prevail. Later I will return to this question of the greater productiveness of American labor, as well as to the question of the great productiveness of American capital, which, however, the latest censuses would indicate to be de-

creasing, as is usually the case when a high stage of industrial development has been reached. I have touched upon them at the present moment simply because it was well at least to note at the outset these favorable factors in the industrial growth of the country.

What, then, are the causes of its immense and rapid progress in this sphere of activity? This question is put by the "Report" itself, and it is interesting to examine the bases on which, according to the "Report," the Americans themselves believe their industrial success rests. These are five in number: their agricultural resources, their mineral resources, their highly developed transportation facilities, their freedom of trade between states and territories, and their freedom from inherited and over-conservative ideas.

The influence of the first two of these factors, above all others derivative from soil and climate, is very great. The United States possesses every variety of soil and every variety of climate except the tropical. And even this it possesses in measure, for the climate of the extreme South is at least semi-tropical. Accordingly it obtains, and very cheaply, an abundance of food supplies and of raw agricultural materials for the use of manufactures. In the production of cotton, for instance, the raw material for the leading textile staple, the United States provides no less than four-fifths of the world's supply. Thanks to the richness of its sub-soil it is no less favored in regard to raw mineral materials. In the production of coal, the keystone of modern industry, it leads the world with (1899) an output of 230,000,000 tons out of an aggregate production of 720,000,000 tons. It is no less favored in regard to iron ore and copper, providing 25,000,000 tons of the world's 79,000,000 tons supply of the former, and 257,000 tons of the latter out of a world's supply of 470,000 tons. In regard to secondary metals it is also favorably situated, being passed

only by Germany in respect to zinc, and leading all countries in respect to lead. Among the common metals tin alone is missing, as in nearly all the great civilized countries.[1] It has available a good supply of nickel, if not within its own borders, at least next door, in Canada. It divides with Russia the production of petroleum, which is steadily becoming more valuable. With France it possesses vast beds of bauxite whence is extracted aluminum, a metal for which a splendid future is predicted and in the production of which the United States already leads all other countries.

Such, then, are its natural advantages. Too much stress cannot be laid on them, and especially on the mineral resources. More than anything else its inferiority in the possession of minerals has hampered the development of France; just as, on the contrary, their mineral wealth has done more than anything else to advance England and Germany. But even England and Germany are less well-endowed in this respect than is the United States. Perhaps the twentieth century will partially compensate France through the development of waterpower as a motive force in industry, for we have a fuller supply of water available for this purpose than has Germany, while Great Britain's supply is so small as to be negligible. But even in point of waterpower the United States is the richest of all. How many Alpine falls would be required to equal the power supplied by Niagara alone? While in the Rocky Mountains, even in the Alleghanies, are to be found many waterfalls waiting to be harnessed. Clearly, Nature would place no obstacle in the way of the industrial development of the United States.

Not only has she bestowed on it the most precious agricultural and mineral riches; she bestows the no less precious gift of means of transportation. The 18,000

[1] Of civilized countries England alone possesses a supply of tin, and her mines are now of only secondary importance.

miles of navigable riverway found in the United States are both of direct value for transportation purposes and of indirect value in compelling the railways to lower their rates in order to meet steamship and barge competition. Best of all, the United States possesses in the Great Lakes a magnificent waterway which, while unfortunately not affording it an ocean outlet, provides it with an unparalleled line of inland transportation having at one end the richest iron and copper mines and the most beautiful forests, and at the other vast beds of coal. The average freight rate on the Great Lakes is today only six-tenths of a mill per ton-mile, while every year the Sault Sainte Marie canals, witness the passage of more than five times as many ships as pass through the Suez canal. The construction of railways has been an easy matter, and in their management the Americans have displayed at once the greatest ingenuity and the most remarkable faculty for organization, succeeding in reducing freight rates to an average of six mills per ton-mile, an average found in no European country, and but a third of the American average itself thirty years ago.

It is quite interesting to find such ardent protectionists as the Americans insisting on the advantages which they derive from freedom of interstate commerce. As a matter of fact, their states form the largest stretch of territory in the world wherein absolute commercial freedom reigns. As former Secretary of State Blaine wrote, in his "Twenty Years in Congress": "It is the enjoyment of free trade and protection at the same time which has contributed to the unexampled development and marvelous prosperity of the United States." Thanks to their vast market and to rapidly increasing population the Americans can avoid the usual dangers of protection and notably the cessation of progress resulting from the absence of competition and from the difficulty of finding trade openings.

Finally, there is no denying that they have enjoyed a great advantage in having been able to build up their industrial system on virtually a *tabula rasa.* In Europe the old guilds, the workmen who transmitted traditions and methods from generation to generation, instinctively and quite naturally resisted the introduction of machinery, just as it is still resisted today by certain classes of wage-earners. Such a phenomenon is of infinitely less frequent occurrence in America where everyone lives, so to speak, in an atmosphere of continual change and is accustomed to the idea of leaving one vocation for another; where the men who have had the energy to go far from home and carve out a new destiny for themselves in a new world, have no fear of innovations. Herein intervenes the human factor, that factor which, after all, is most essential to the greatness of a nation provided nature furnishes the material necessary to allow it expression. Partly because he is the product of a selection of the hardiest of the sons of the Old World, partly as a result of his environment, the American is peculiarly energetic, enterprising, progressive and ingenious in inventing machinery and utilizing it. It is in these remarkable qualities, as well as in the wonderful wealth of the land in which he lives, that the secret of his success is to be found.

CHAPTER II

HOW AMERICAN INDUSTRY IS ORGANIZED

American manufacture which although of the most recent development has become, for the reasons just stated, the most powerful in the world, may be said to typify modern manufacture conducted under the most favorable conditions. It is, therefore, highly instructive to examine in some detail its mode of organization and its tendencies and to learn what forms it has assumed in order to make such excellent use of its available natural resources which would not, however, have sufficed to assure its prosperity had not its human effective force disposed of them with great ingenuity.

Just as when we were studying the agriculture of the country the attempt was made, first of all, to ascertain in what proportion the farming lands were divided into large, average and small holdings; so should we now begin by examining the roles played by large and small manufacturers in the industrial activity of the Union. Whether from the social or from the economic point of view nothing can be more important than to determine what degree of concentration of production prevails and the tendencies manifest in this direction.

And, first, it has been seen that in 1900 there were in the United States 512,339 manufacturing establishments employing 5,316,802 workmen, who received wages amounting to $2,329,000,000; that these establishments possessed a total capital of $9,835,000,000, and that their products had a value of $13,000,000,000.

The number of establishments is three and one-half

times as large as that of 1860, the number of workmen four times as large, the aggregate amount of capital invested nearly ten times greater, that of wages paid six times, and that of product value likewise six times. This does not indicate a very clearly marked tendency to increasing concentration so far as concerns the number of employees per establishment; but in this respect it will shortly become apparent that certain reservations must be made. It is evident, however, that if the average establishment does not seem to have more employees it assuredly has a capital value nearly three times as great as the capital value of forty years ago, and that the product value is nearly double the product value then returned. Moreover, nearly twice as large a sum is paid out in wages.

From this it follows that, in order to obtain a given product value, more capital was needed in 1900 than in 1860. This usually happens when a country and an industry cease to be quite new, when competition develops and causes a fall in prices, and when successive improvements in methods and processes call for an increased investment of capital. On the other hand, since the value of the products has increased more than six-fold during the forty years under review, while the number of workmen has only quadrupled, it is evident that to make goods of a given value less labor was required in 1900 than in 1860.

Further, the total wage distribution has increased not only in proportion to the increase in the number of employees, but even more rapidly,— almost in the same proportion, in fact, as the increase in the product value. This means that since 1860 labor has enjoyed an increasing remuneration. The remuneration of capital, however, has decreased, and for two reasons: (1) the gross value of the products obtainable with a given amount of capital is less today, and (2) the profit to be

realized on a given amount of business is, as we shall later see, also smaller.

This contrast between the reward of labor and the reward of capital is interesting. To be sure, it only confirms the experience of Europe. But it is worth while observing that even in the United States, most modern of all countries, the facts completely contradict the socialistic theories concerning the iron law of wages, the increasing pauperization of the proletariat, and the exorbitant profits of capital.

In reality, the number of industrial establishments has probably increased less rapidly than the statistics of the successive censuses would seem to indicate. Every census is taken more carefully than was its immediate predecessor so that errors by omission become constantly fewer and fewer. Now, the industrial establishments unlisted by former censuses were doubtless, almost without exception, small plants giving occupation to a number of workmen less than the average number per plant. In other words, their omission has reduced the number of establishments in a greater proportion than the number of employees, and has consequently had the effect of masking the tendency to concentration which one is surprised not to find more marked. But even taking this into account, no matter what importance is attached to such errors unless it be held that the census of 1860 was totally erroneous, which it certainly was not, the conclusion is inevitable that concentration is less pronounced than one is at first tempted to believe.

It should be carefully borne in mind that what has just been said of the omissions of numerous small establishments from the statistics of previous censuses affects but slightly the statistics relating to the number of workmen employed, their wages, the capital invested and the value of the output, precisely because these establishments have escaped statistical observation only by

reason of their small importance. Therefore the observations that have been made on the conditions confronting capital and labor, on the increasing rewards of the latter and on the decreasing productivity of the former, hold their full force. In so far as concerns wages, it would even seem that they carry more weight than was at first ascribed to them; for in the small establishments omitted the wage list must have been very small, much of the labor being supplied by apprentices or by members of the operator's family, so that the wage average was actually lower, from 1860 to 1880, than appears from the figures of the census.

The 512,339 establishments enumerated in 1900 gave employment to 5,316,802 workmen, or an average of a little more than 10 employees to every establishment. The establishments listed, however, are only establishments producing more than $500 worth of goods every year. Of course, a workshop having a smaller production (it is not a question of profits) is of small importance. But there are many such. They have been statistically tabulated by the latest census for the first time, and have been found to total nearly 130,000. They are included in the accompanying table, which, distinguishing between hand trades and industrial workshops proper, shows the exact status of American industry in 1900.

As this table stands, it lacks an interesting element — the number of employees paid by the month or by the year, and the total of their salaries. By referring to the table given in the preceding chapter, it will be seen that the number is 397,174, of which only 22,342 are found in the hand trades. Their salaries aggregate $404,000,000, of which a little less than $16,000,000 is paid to those employed in hand trades.

From the present figures it follows that if manufacture proper occupies less than half the establishments it employs nineteen-twentieths of the money invested in in-

	Hand Trades.	Establishments with a product of less than $500.	All other Establishments.	Total.[1]
Number of establishments	215,814	127,419	296,440	640,194
Capital (in millions of dollars)	392	44.4	9,425	9,862
Proprietors and firm members	242,164	136,127	330,457	708,738
Wage-earners	559,130	64,702	4,749,276	5,373,108
Wages (in millions of dollars)	288	2.1	2,034	2,324
Miscellaneous expenses (in millions of dollars)	125	2.5	903	1,030
Total cost of materials (in millions of dollars)	483	8.9	6,863	7,365
Cost of raw materials (in millions of dollars)	9	1.4	2,380	2,392
Cost of partially manufactured materials (in millions of dollars)	463	7.4	4,171	4,650
Cost of fuel, freight, etc. (in millions of dollars)	11	...	311	323
Value of products (in millions of dollars)	1,184	29.8	11,821	15,063

dustry, nearly nine-tenths of the workmen so engaged, and makes more than nine-tenths of the output. In petty manufacture one may fairly class, with few exceptions, all the hand trade establishments, and, with no exceptions, all establishments with an output worth less than $500. Turning to those with a greater output,— to manufacturing places proper,— where every establishment has, on the average, $31,400 of capital, occupies 16 workmen, and makes $39,400 worth of goods, let us examine their affairs somewhat closely, in order, in so far as may be possible, to draw a line of demarcation between large, average and small establishments.

For this the "Report" of 1900 is extremely helpful. From one of its most interesting tables (in which the

[1] These totals include, in addition to the establishments statistically surveyed in the first three columns of the table, 138 governmental establishments and 383 establishments belonging to various educational, eleemosynary and penal institutions. These, it is to be observed, were not enumerated in preceding censuses and do not appear in the total of 512,339 already given as the number of industrial establishments in the United States. In the present table, moreover, it has not been found possible to incorporate complete statistics relating to them, for which reason there are slight discrepancies between the figures here given and those given in the table used in connection with the preliminary observations on American industry.

industrial establishments are classified according to the number of employees, including salaried officials as well as workmen, but not the proprietors or their associates) it appears that out of the 512,254 private establishments,[1] making more than $500 worth of goods, that were found in the United States in 1900, there were 110,510 (more than 20 per cent) with no employees, all the work being done by the owner or owners; 232,726 (or 45 per cent) with less than 5 employees, and 112,138 (or 22 per cent) employing from 5 to 20 people. And even this last class may be included in small-scale manufacturing, which thus absorbs no less than 89 per cent of the industrial establishments of the United States, and this though account is taken only of those establishments whose annual output exceeded $500 in value. What would be still more interesting would be to learn the number of people finding employment in small-scale manufacturing, but no definite information on this point is forthcoming. Let us, however, suppose that the average number of employees in establishments having less than 5 is 2; and let us also suppose that the average number in establishments having from 5 to 20 employees is 10: it would follow that the number of employees occupied in small-scale manufacture as a whole is nearly 1,587,000 out of a total, for all manufacture, of 5,700,000. But it is necessary to include also the proprietors and their partners, who aggregate slightly more than the number of establishments. It certainly would not be far out of the way to place their total at 500,000 for small-scale manufacturing, which would thus give occupation to from 2,000,000 to 2,100,000 people, or almost exactly a third of the 6,300,000 occupied in manufacturing as a whole. Even admitting that these figures are slightly too high it would certainly seem impossible to

[1] This total includes all private industrial establishments and hand trades. But it does not include governmental establishments or establishments belonging to educational, eleemosynary or penal institutions.

estimate the number of people occupied in small-scale manufacturing at less than 1,800,000, which is obviously a considerable proportion of the whole.

What may be called "average manufacture," in which each establishment employs from 20 to 100 workmen, comprises 43,000 establishments (or 8 per cent of the total number of establishments) of which 32,408 employ from 21 to 50 people, and 11,663 from 51 to 100 people. Estimating the average number of employees in each group at respectively 25 and 60 per establishment, a total of 800,000 for the first and of 700,000 for the second is obtained, or a grand total of 1,500,000, to which must still be added the number of proprietors and partners. But, for fear of over-estimating, let us omit this additional total. In any event, average manufacturing gives employment to about a quarter of the industrial population, and the total number of establishments employing not more than 100 people per establishment forms more than 97 per cent of the total number of establishments, and appears to give employment to 3,500,000, or more than half of the total employed in manufacturing.

The remainder derive their living from large-scale manufacturing, which includes 8,494 establishments employing from 101 to 250 people per establishment, 2,809 having from 251 to 500 employees, 1,063 having from 501 to 1,000 employees, and, finally, 443 establishments having more than 1,000 employees and salaried officials, clerks, etc. Thus while enormous factories of the last two classes — whose existence is the distinctive characteristic of modern industry — are not very numerous, they give employment to a large proportion of the industrial population of the United States — doubtless about 20 per cent. The largest of all is an iron and steel factory in Ohio, which employs 7,477 people; next comes a cotton mill in New Hampshire with 7,268 employees;

next an agricultural machinery factory in Illinois, with 6,728 employees; and next an electrical apparatus factory in Pennsylvania, with 6,318 employees. Four other steel works, in Pennsylvania, Illinois and Massachusetts, give employment to from 4,000 to 6,000 people. Another agricultural machinery factory in Illinois and an electrical apparatus plant, also in Illinois, have more than 4,000 employees.

These monster establishments belong to industries in which the tendency to concentration is much more marked than in the generalty of industries. For example, in 1860 the iron and steel output of the country was made in 542 establishments each having, on the average, a capital of $82,000, employing 65 workmen, and making $97,000 worth of goods. In 1900 there were 668 iron and steel works, a smaller number than in 1890, 1880 or 1870, and the average capital of each was $858,000 (ten times as great as forty years before, and three times as great as twenty years before), while the average number of workmen employed was 333 and the average product value $1,203,000. Again, in 1860 cotton manufacture claimed 1,091 establishments, and in 1900, 1,055. This, to be sure, was a higher total than any recorded in the intermediate censuses. But the increase is negligible compared with the increase in capital, employees and product value per establishment — respectively from $90,000 to $442,000, from 112 to 287, and from $106,000 to $321,000.

The manufacture of agricultural machinery affords an even more striking illustration of rapid concentration. Forty years ago such machinery was made almost altogether in small factories, although the celebrated McCormick establishment dates still further back; today the industry must be reckoned a branch of large-scale manufacture. In 1860 there were no less than 2,116 agricultural machinery plants, but each averaged only $6,500

capital, 8 employees, and a product value of $9,800; today there are not more than 715 establishments, but their average capital is $220,000, they average 65 workmen, and boast an average product value of $141,000. The glass, paper, leather, lumber, hosiery, woolen goods, silk, carpet, food products, liquor, shipbuilding and, though to a smaller extent, tobacco industries also display a very evident tendency to concentration.

In short, this tendency is unquestionably sharply marked in the industrial life of the United States, and its effects are making themselves rapidly felt in many branches of manufacture. A large number of others escape only seemingly, by reason of the increasing exactitude of the census schedules, which today take note of small establishments that were formerly unlisted. Such is the case with the butter and cheese industry. But it is equally evident, according to the figures given above, that side by side with large-scale manufacturing, average and small-scale manufacturing play important roles. It should also be remembered that every large-scale industry generally gives being to small-scale industries, if only for repairs. Even in the United States, where comparatively little repairing is done, there are among the hand trades 85 shops for the repairing of typewriting machines, 396 for the repairing of sewing machines and 6,331 for the repairing of bicycles and tricycles. Therefore, despite the undoubted tendency to the concentration of production in large establishments, it cannot fairly be said that small establishments are disappearing.

CHAPTER III

THE ROLE PLAYED BY CAPITAL IN AMERICAN INDUSTRY

Before examining the different branches of American industry, it will be well to study in a general way its three great factors — capital, labor and motive power (when the motive power is distinct from the power furnished by man, which is always the case in large-scale and average manufacture and which constitutes a basic characteristic of modern industry). It has just been seen that the amount of capital employed in American manufacturing establishments aggregates more than $9,800,000. In this sum, it is necessary to keep in mind, is included neither the capital invested in mineral enterprises nor that of transportation companies, railways, etc. This explains why the industrial capital forms little more than 10 per cent of the total wealth of the United States which was appraised in 1900 at $94,000,000,000, double, or a little more than double, the estimated wealth of France, the population of the United States being likewise almost exactly double that of our country.

What does this $9,800,000 of industrial capital represent, and, first, what is the exact definition of the term "capital" as the census bureau of the United States employs it — for there is more than one way of defining capital of this sort? The questions written in the schedules of the census of 1900 recognize, for every industrial establishment, four different kinds of capital, the amount of each of which is to be entered separately — land, buildings, machinery, tools and implements, and "live

capital," the last named including cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, and finished products on hand. "The answer," ran the directions accompanying the form of inquiry, "must show the total amount of capital both owned and borrowed. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given."

The form of inquiry used in 1900 was also that used in 1890. Therefore the statistics of these two years — $6,525,000,000 of capital for 1890 and $9,818,000,000 [1] of capital for 1900 — are comparable and one is justified in saying that the amount of capital invested in industry increased by about one-half in the course of the decade. In the census of 1880, on the contrary, as in previous censuses, the form of inquiry was most general, it being merely asked what amount of real and personal capital was invested in the given business.

General Walker, the distinguished statistician, who had charge of the division of industry in the censuses of 1870 and 1880, did not hesitate to declare that, put thus baldly, the inquiry into capital could have no useful result, for the question was so loosely worded as to give room for diverse interpretations. In many instances the live capital seems to have been omitted, at least in part; certain elements in the fixed capital, such as the value of waterpower furnishing motive force, were passed over in silence; capital resting on discounted paper was as a rule not counted, and could not be owing to the wording of the question. From this it follows that it would be rash to affirm that the amount of capital invested in industry more than doubled from 1880 to 1890. The aggregate of $2,790,000,000 reached by the census of 1880 seems

[1] In all these general observations I neglect, as the "Report" has neglected, the small establishments which have an annual product value of less than $500.

to be too general to be comparable with the totals of 1890 and 1900, and the increase is probably less rapid than might be inferred from a first glance at the statistics.

Some American statisticians and economists, among whom is General Walker himself, seem to think that it would be well to drop all inquiry into the amount of capital invested in industry, because of the difficulty of obtaining even approximately correct returns, and because of the objections raised by those to whom the questions are addressed. Uncertain and unreliable, observes Professor Mayo-Smith, the results obtained run the risk of giving rise to very misleading inferences in regard to questions of the relative importance and the relative rewards of capital and labor. The inquiry is still continued, nevertheless, but the definition of capital has been, as was shown, made more exact in order to avoid misunderstandings and to include everything that may actually be said to come under the head of industrial capital. In my opinion, this is the right course to pursue, for the statistics thus obtained are highly interesting even though they must be considered only approximate, in view of the number and significance of the causes of error which, owing to force of circumstances, yet remain.

The "Report" on the census of 1900 does not seek to minimize or conceal these defects. On the contrary it draws attention to them. American statistics, as was said before, are presented with great frankness and do not pretend to possess absolute accuracy when absolute accuracy is impossible of attainment. Should occasion arise, stress is laid on the fact that it will not be safe to repose too much confidence in the figures presented. There is hardly a chapter in the "Report" that is not accompanied by remarks concerning "limitations upon the use of census statistics." The reader is constantly warned not to enter into a too minute analysis of the figures, and not to seek to find in them economic indica-

tions which they cannot always afford. Therefore, thanks to the care with which sources of error are noted, it is always possible to see to just what extent one may legitimately generalize, and just where the danger line begins. I wish I could say the same of our French statistics, which are often more carelessly put together than the American, and in which no attempt is made to separate the wheat from the chaff.

Concerning the particular point under discussion it is clear, as the "Report" says, that "although the land, buildings and equipment of a factory are in themselves sufficiently tangible and definite their value is, in a large measure, intangible and indefinite. . . . The value of the land upon which a factory is built may depend altogether upon the fact of its being occupied as the site of that factory, and upon the continuance of the latter as a going concern." The same may be said of the buildings, and, to a lesser degree, of the machinery. As a general rule, says the "Report," the figures of the census represent market values. But it is obvious that, in the case of most old and successful establishments, the total investment in the plant must be very much greater than the actual market value.[1]

Further, if the elements composing live capital can be evaluated with more certainty (allowances being made for doubtful debts), duplications are inevitably encountered. Thus, as the "Report" points out, in citing credit capital as a concrete illustration: "An establishment does not, as a rule, make use of its credit to the same extent throughout the year. Some establishments, during the period when the census returns were made, were borrowing heavily in order to acquire stocks of raw material or carry finished products; others were at that

[1] It should be carefully kept in mind that in all census statistics relative to industrial capital, the reference is not to the capitalization but to the true value, in money, of the different establishments, and that this value is often very different from their capitalization.

point in their year's business when the amount of credit utilized was small, or nothing, or even much less than the amount of credit they were extending to others. . . . Loans to one firm may have been reloaned by that establishment to a second, and by that second to a third." Whence duplications, or even reduplications. Moreover, the "Report" continues, a given establishment constantly has open accounts with other establishments for the purchase of materials, or the sale of products. The total of these accounts mounts to an enormous figure, and more duplications are the result. "For example, a yarn mill will report as a part of its capital the amount of money owed it for the yarn sold to another establishment which reports the identical yarn as a part of its stock on hand or in process." It is thus very difficult to arrive at any exact estimate of the amount of capital invested in American industry, however possible it may be to give a definition of capital sufficiently exact for census purposes.[1]

The fact that no value is attributed to leased property makes the statistics still more imperfect. Two establishments exactly alike, one of which occupies buildings and land belonging to it, while the other leases its plant, appear in the statistics with a distinctly different capital value. It is evident, however, that whether or not a plant in which an industry is practiced belong to the operators, it is a part of their capital. Finally, many establishments have part of their capital invested outside their particular industry but for purposes accessory to that industry. Thus iron works in the United States frequently own iron or coal mines and railways or steam-

[1] In his "Report" on the census of 1870 General Walker declared that he was unable to give such a definition. Indeed, he went so far as to say that, even though he were permitted complete access to the books of a manufacturing establishment, conducted by two or more partners, and were granted the frankest exhibit of the assets both of the firm and of its individual members, he would be puzzled to make up a statement of the capital of the concern in respect to which he would feel any assurance. What, then, he concluded, can be accomplished when to such inherent difficulties is added the reluctance of the manufacturers to answer an inquiry of this character?

boats for the transportation of ore or fuel. The attempt has been made, tho not without difficulty in certain cases, to estimate the amount of capital thus withdrawn from manufacture proper, and to exclude it from the category of industrial capital. But, apart from the uncertainty attending such estimates, it may fairly be asked to how great an extent is it permissible to withdraw the capital employed in auxiliary enterprises which are often more or less directly necessary to the operation of the main industry?

Keeping in mind the necessary reservations just suggested let us see how the capital invested in industry in 1890 and 1900 was distributed. For this purpose the following table will prove of some assistance:

DISTRIBUTION OF AMERICAN INDUSTRIAL CAPITAL.

	1890. (In millions of dollars.)	1900. (In millions of dollars.)	1890. Per cent.	1900. Per cent.
Land	775.6	1,027.5	11.9	10.5
Buildings	878.6	1,450.5	13.4	14.8
Equipment	1,584.3	2,543.1	24.3	25.9
Cash, etc.	3,286.7	4,796.4	50.4	48.8
Total	6,525.2	9,817.4		

As will be seen, each element shows virtually the same proportion for 1890 and for 1900; and, on account of the numerous sources of statistical error, it would be unwise to draw inferences from the feeble variations disclosed. All that may be said is that about half of the capital invested in American industry is "live capital" and the other half "fixed capital," of which the mechanical equipment constitutes 50 per cent. Buildings and land compose the remainder, with a superior investment in the former.

To this, as already hinted, should be added the value of the leased property occupied for manufacturing purposes. During the census year 1900 the aggregate

amount of rent paid on such property was $96,708,226, which represents an enormous amount of real estate. Just what this amount is an attempt was made to ascertain in the census of 1890, with the result that it was said to be equivalent to a monetary value of $1,156,000,000. The "Report" on the census of 1900 considers such an estimate to be too conjectural and by a new method of calculation, estimating the rental on a basis of 8 per cent of the capital, finds the real estate value to be $1,196,000,000, which is equal to almost half the value of the land and buildings owned by the manufacturers who occupy them. An extremely large number of small and average establishments carry on their business in rented quarters. In New York and Chicago, for instance, industrial plants are often located in the upper stories of buildings of which the lower floors are utilized for mercantile purposes. Taking all things into consideration, the amount of money invested in industry in the United States must be a little more than $11,000,000,000.

Knowing this it would, were it possible, be very interesting to compute the aggregate amount of annual industrial profits and to compare the share of labor and the share of capital therein. Unfortunately, only a rough estimate of the profit total is obtainable. This should be given, however, because despite certain necessary reservations, which the "Report" does not fail to mention, some important deductions may be made. And, first, I would draw attention to the table on next page.

From this it appears that the reward of capital was, in 1900, more than two-thirds that of labor, a higher proportion than in 1890. This is explainable by the fact that in 1900 the country was enjoying a period of prosperity. In such circumstances wages advance more slowly than do profits, just as, during periods of depression, they fall more slowly. It should be observed, too, that during

the decade the amount of money invested in industry increased more rapidly than the excess of the value of the profits — as the table below shows clearly enough. Viewing this excess as a net profit, the net profit would be 19.4 per cent on the amount of capital invested in 1900 in place of 19.9 per cent in 1890.

INDUSTRIAL EXPENSES AND RETURNS IN 1890 AND 1900.

(IN MILLIONS OF DOLLARS.)

	1890.	1900.
Value of products	9,372.4	13,004.4
Expenses:		
Cost of materials	5,162.0	7,345.4
Salaries and wages	2,283.2	2,726.0
Miscellaneous	631.2	1,027.8
	8,076.5	11,099.2
Excess over expenses	1,295.9	1,905.2

As a matter of fact, the excess cannot be considered a net profit. The expenses shown in the table do not comprise losses through depreciation of equipment, through bad debts, etc. And in such a country as the United States equipment depreciation is very rapid. In the cotton industry, for instance, as the "Report" says, "such is technical progress that it is calculated that a factory must renew its equipment every ten years if it is to be operated at a profit."

It further mentions the fact that in the single state of Massachusetts 21 mills, with an aggregate of 154,000 spindles, and one mill with 180 looms closed down between 1890 and 1900. Seven of these mills, with about 48,000 spindles, were dismantled and their machinery was sold; thirteen mills, with 101,000 spindles, stood idle in 1900 or had been turned to other manufacturing purposes; one mill had been burned and not rebuilt, and another had been consolidated with a neighboring mill. According to the "Report," moreover, the total number

of industrial establishments idle in 1900 was 3,864, representing an investment of $99,500,000.[1] On the other hand, 44,705 establishments, each having a product value of more than $500, came into being in 1900.[2] These figures give an idea of the unceasing activity of industrial life in the United States, but they also indicate the severity of competition there and the reserves which must be taken from the profits in order that the operator may keep pace with the competitors who rise every day armed with the most improved machinery and the most up-to-date processes. Taking these reserves into consideration, and also those necessary to meet the various exigencies of business, the profits accruing to capital are by no means so large as would seem at first sight. It is a fact, however, that energetic and enterprising men can make higher profits in the United States than elsewhere. The others stagnate, as they do everywhere, and are perhaps ruined more speedily. New countries are splendid agents of selection.

Among various reasons for the prosperity of American industry the "Report" cites the facilities which the majority of states afford for combination of capital. Concentrated largely in great establishments — altho, as we have seen, there are still many small establishments — industry in the United States more than anywhere else has recourse to combination in order to procure the vast sums necessary for its maintenance. The preponderating role played by combination is strikingly exhibited by the "Report" on the census of 1900 in the chapter entitled: "Character of Organization of Industrial Establishments." There are three great classes of establishments — those that are the property of an individual, those

[1] This refers only to establishments still provided with equipment and able to resume operations. Absolutely abandoned establishments or establishments in which dismantling had begun, were not reported by the enumerators.

[2] According to the "Report" itself this total appears to be somewhat inflated. A certain number of establishments which were reported as "new," were simply reorganized or had undergone sundry important changes. None the less, the actual total must be quite high.

which belong to firms of unlimited liability, and those belonging to corporations of limited liability. The last named is the most modern type of industrial combination. Thanks to the facilities it affords for the gathering together of capital beyond the resources of the private individual, and the ease with which its shares may be transferred, it permits even the smallest investor to participate in large undertakings. From each it demands only the amount of money he desires to invest, it allows each to withdraw his money easily, and it permits each to see in advance just the degree of risk he will assume. Than the corporation there is nothing better adapted for the concentration of a large amount of capital. Hence it holds first place in the organization of American industry.

Of the 512,254 private industrial establishments, having a product value of $13,004,000,000, that were operated in the United States in 1900, nearly three-fourths (372,703 to be exact) belonged to a private individual. But these made only $2,675,000,000 worth of goods, or a little less than 20 per cent of the total product value. Establishments to the number of 96,715 were conducted on the partnership basis and made goods amounting in value almost to the same sum — $2,565,000,000. Only 40,743 establishments, or less than one-ninth of the total number, were the property of corporations; but these made $7,734,000,000 worth of goods, or almost exactly three-fifths of the total product value. In addition to these there were 2,093 establishments operated by co-operative and miscellaneous concerns, making a little less than $31,000,000 worth of goods.

Thus three-fifths of the industrial production of the United States comes from establishments conducted by corporations. No statistics on this subject are available in France, but it cannot be doubted that the corporation plays a much less important role in our country. Outside of the metal, lighting and a few other less important

branches, the simple partnership of unlimited liability is the prevailing type when our industrial enterprises are not operated by individuals. Nor should it be forgotten that the railroad, street-car and steamship companies, organized almost wholly on the corporation plan, are not included in the American industrial statistics we have just been considering.

On the other hand, they include the hand trades which, naturally, are with comparatively few exceptions in the hands of small operators, working alone or with one or two partners. Of the 215,844 establishments of this class, 183,523 are operated by an individual — or almost exactly one-half of the total number of establishments so operated; 29,590 by partners, and only 2,691 by corporations. Leaving the hand trades out of account, the following significant table may be drawn up:

FORMS OF ORGANIZATION OF AMERICAN INDUSTRY.

	Number of establishments.	Per cent.	Product value (In millions of dollars).	Per cent.
Individual manufacturers	189,180	63.2	1,897	16.0
Partnerships	67,125	23.4	2,260	19.1
Corporations	38,052	12.7	7,633	64.6
Co-operative societies, etc.....	2,093	0.7	31	0.3
Total	296,450	100.0	11,821	100.0

Outside the hand trades operated by small individual artisans it appears, then, that nearly two-thirds of the goods manufactured in the United States are produced by corporations. The remaining establishments of the company class produced a little less than one-fifth, and single operators less than one-sixth. In regard to co-operation we find that it plays only an infinitesimal part in production.[1]

[1] Following the "Report," I might mention, however, that there is one industry in which co-operation figures prominently. This is the manufacture

The industries in which the corporation form of organization predominates are naturally those wherein concentration has been carried to the highest point, for such have the greatest need of a large accumulation of capital. Among these are the iron and steel industry, the manufacture of vehicles for land transportation,[1] the manufacture of chemical products, and the manufacture of metals and metal products other than iron and steel. In the manufacture of iron and steel, corporations produce $1,508,000,000 out of $1,793,000,000 worth of goods, or 84 per cent; in the manufacture of chemical products, $450,000,000 out of $553,000,000 worth, or 81 per cent; in the manufacture of vehicles, $430,000,000 out of $508,000,000 worth, or nearly 85 per cent, and in the manufacture of metals and metal products other than iron and steel, $578,000,000 out of $749,000,000 worth, or nearly 77 per cent. In shipbuilding, corporations construct $55,000,000 out of $74,000,000 worth of vessels, or 74 per cent, and in the production of liquors and beverages $305,000,000 out of $425,000,000 worth, or 72 per cent.

What a difference between the organization of the last named industry in a country like the United States with its enormous breweries and distilleries,[2] and its

of dairy products — butter, cheese, condensed milk. Of the 2,093 establishments of co-operative or miscellaneous ownership, 1,765 (or nearly four-fifths) were co-operative dairies, having a gross product value of more than $24,000,000. As is well known this industry is peculiarly adapted for operation on the co-operative plan. The Danes have been eminently successful in this field and along this line, as have, though to a lesser degree, the Swiss, the Germans and the Dutch, and it is to be regretted that our producers have not followed more closely the path thus pointed out to them. Outside of co-operative dairies, the majority of the "miscellaneous ownership" group of establishments were the property of so-called "communities," and of a number of societies, churches and colleges which had printing-shops for the publication of periodicals. While we are on the subject of co-operation, I might remark that co-operative purchasing societies, which are the most important, do not figure in these industrial statistics.

[1] In this group the manufacture of railway and street cars holds first place in America, the manufacture of carriages and wagons being but secondary.

[2] Of the 7,861 establishments in which liquors and beverages are made, only 1,333 belong to corporations, but these are by far the most important. Further, a certain number of growers make wine on their premises which are not included in the 7,861 establishments. The majority of the growers, however, sell their grapes to manufacturers, so that concentration of production

organization in France where production is largely in the hands of small individual manufacturers who are primarily agriculturists. And, it may be observed in passing, is it not evident that this radical difference in organization must cause an equally radical difference in the way in which the liquor tax problem presents itself? I do not intend to dwell on this point. I merely wish to suggest that it is by no means wise to take for granted that a system of taxation that operates to the satisfaction of all in certain countries can have equally good results in countries where conditions are totally different.

In the manufacture of food and kindred products, and in the paper and printing industry, establishments operated by corporations account for about two-thirds of the total product value — $1,414,000,000 out of $2,278,000,000 in the case of the former, and $369,000,000 out of $606,000,000 in the case of the latter. In the glass industry corporations provide more than half the product — $157,000,000 out of $293,000,000. Their share is also more than one-half in the very important textile industry — $827,000,000 out of $1,637,000,000. In fine, of the thirteen general groups into which the census divides the country's industries, there are only three in which corporations do not transact by far the greater part of the volume of business. These three are the leather industry — $258,000,000 worth of products made by corporations, $209,000,000 worth made by other companies, and $117,000,000 worth made by individual operators, out of a total of $584,000,000; the lumber industry — $508,000,000, $256,000,000 and $266,000,000 respectively, out of a total of $1,030,000,000; and the tobacco industry — $128,000,000, $74,000,000 and $80,000,000 respectively out of a total of $284,000,000. In the case of the "miscellaneous industries" corporations

is, after all, the distinctive characteristic of the liquors and beverages industry in the United States, a characteristic still more pronounced in England and all northern countries.

are once more far in the lead, with $642,000,000 worth of products out of a total product value of $1,004,000,000.

It is important to notice, however, that even in those industries in which corporations predominate so far as concerns the value of the output, they are far from operating the majority of the establishments connected with the industries. Thus, in the manufacture of iron and steel they operate only one-third — 4,843 out of 13,896 establishments; in the manufacture of vehicles for land transportation, less than one-fourth; in the manufacture of chemicals and allied products, in which they are strongest numerically, almost two-fifths — 2,206 out of 5,444 establishments. On the other hand, in each of the fourteen groups (including "miscellaneous industries"), with the exception of the chemical and iron and steel industries, individuals operate more than half the total number of establishments. This is additional proof that large-scale manufacturing permits the growth of, and frequently creates, an average and small-scale manufacturing, the effective strength of which remains high.

If we were to pass from the general groups and inquire into the conditions obtaining in specific industries, we should find some industries which, in America, are almost entirely controlled by corporations while, in Europe, they are still operated on the partnership system or by individuals. Among such is the wholesale slaughtering and meat packing industry. "This," says the "Report," "has been due to the trade necessity of centralizing slaughtering at a few points convenient both to a large supply and to transportation facilities for quick delivery to the principal distributing markets in the United States and in foreign countries; and to the advantage of locating and supporting agencies in these markets." In these few lines is compressed the entire

evolutionary philosophy which has given birth to the policy of concentrating industrial production in large establishments.

Of the other industries in which corporations predominate, I shall mention only the textile. In the manufacture of cotton goods corporations make 90 per cent of the product value and own 73 per cent of the total number of mills. In the manufacture of worsted and woolen goods they play a less imposing role, and a still less imposing one in the silk industry in which but 62 per cent of the product value is made, and but 40 per cent of the total number of establishments are owned by corporations. Much the same conditions obtain in the hosiery and knit goods business, corporate activity being represented by 55 per cent of the product value and 34 per cent of the number of establishments. In the minor branches of the textile industry corporations are even less prominent. Thus, in a single group the prevailing type of organization varies greatly. In fact, it may safely be said that as a general thing the corporation holds a proportionately less important place the more diversified the product, the more delicate it is, the more it is of a character necessitating constant and watchful supervision by the factory chief — in short, the less the specific branch of the given industry lends itself to large-scale manufacturing.

It would, therefore, seem certain that there will always be a goodly number of industries which may be most advantageously operated by individuals. Nevertheless, it cannot be doubted that the concentration of capital, as of labor, is far from having reached its *ultima Thule*. Nor can it be doubted that it is even tending to invade industries which have thus far escaped it, and that this forward march, as is shown by the conditions prevailing today in the food, leather and many other industries, is much more advanced in America than in Europe.

The question may be asked — Does the ordinary incorporated company represent the highest degree of concentration of capital to be found in the modern industrial world? Is it not surpassed by a new type which has most strikingly developed in the United States, where it is generally known under the name of "trust," but is also designated by the more comprehensive and perhaps more just term of "industrial combination"? Those enormous accumulations of capital, to which so much attention is paid nowadays represent, in the eyes of some observers, the industrial type of the future, while others regard them as merely unhealthy, even monstrous growths. Before examining them, it is necessary to define them.

First, then, what is a "trust"?

The answer is not easy, although much has been written on the subject. The "Report," in the sections devoted to "Industrial Combinations," puts it thus: "For the purpose of the census the rule has been adopted to consider no aggregation of mills an industrial combination unless it consists of a number of formerly independent mills which have been brought together into one company under a charter obtained for that purpose." Many large companies not resulting from the fusion of old establishments but including a large number of new plants, are excluded under this definition. This fact the "Report" does not endeavor to conceal. But it believes that if any other definition is adopted it will be difficult to find any precise statistical criterion.

It has elsewhere been proposed to give the name of "trust" to every group of establishments which succeeds in securing for itself the monopoly of a given industry, if not the absolute monopoly — which it is almost impossible to obtain and which has thus far been obtained in the case of no industry, not even the oil industry which is in the hands of the oldest and most powerful

of trusts — at least the control of a sufficiently large part of the production to enable it to fix prices and preserve them from the influence of competition. But even this definition lacks finality. Indeed, on examining it closely it becomes evident that it is applicable to very few companies.

Perhaps, however, it is going too far to believe that all the great American "industrial combinations"— or in the popular, briefer and more convenient, however improper, term, "trusts"— aspire at market monopoly and also absolute control of prices. Most assuredly it would be going too far to believe that they could succeed in any such aspiration. It must be borne in mind that there are always two sides to a "trust"— the industrial and the financial. Industrially, beyond doubt, the trust very often aims at exercising a substantial influence on prices by bringing under one control a large proportion of the factories engaged in manufacturing a given article. But it is to be observed that it frequently does not confine itself to this. It also consolidates factories in which a given article undergoes the successive processes necessary to convert it from a wholly raw to a marketable state. Thus, in the textile industry, a single corporation may control yarn and cloth mills, clothing factories, etc.; or, in the iron and steel industry, blast furnaces, rolling mills, foundries and machine shops. The trust thus constitutes, as it were, a reaction against carrying to an extreme two of the most prominent tendencies in modern industrialism — division of labor and specialization of product. These, of course, have distinct advantages in that they permit the production of different articles on a very large scale and in a highly perfected condition. But it may reasonably be argued that there are also advantages in having the various factories of a given industry under one control. For example, the factory requiring iron and steel for the manufacture of machine

parts is always sure, if the iron and steel works are under the same management that it is, of having its demands filled at the precise moment of desire and in the desired quantity; which could not always be the case if the plant manufacturing iron or steel and that converting the metal into a finished product were quite independent of one another.

The financial side of the trust consists chiefly in procuring returns for those who have promoted it. Almost invariably, when several companies combine the total capitalization of the combination is much larger than the sum of the capital engaged in the subsidiary companies. Most frequently, the excess does not represent any actual assets, any money really paid in. It is "water," as the Americans say. Thus are created shares which the founders of the trust themselves distribute, seeking to unload them upon the public at the highest price possible. Many trusts have no other reason for existence than the infusion of water into the capital of the subsidiary companies.

The "boom" period of extraordinary economic prosperity which began in the United States in 1897 or 1898, has been characterized not only by a remarkable industrial development and by the concentration of production in larger and ever larger establishments, but still more by an extraordinary concentration of industrial capital. Great enterprises, either identical in character or complementary to one another, have been merged or else have been acquired by gigantic companies formed for the purpose and seeking to monopolize entire industries or at any rate to control a sufficiently large proportion of the production to regulate prices at will. Such is the "Trustomania" as it has well been called. It seems to me that it has frightened Europe too much.

There is, in fact, a certain point, varying according to the industry, beyond which concentration ceases to

be advantageous and becomes positively hurtful. The intellectual powers of one man, however gifted mentally, however energetic, however industrious that man may be, are unequal to the task of effectively directing the mammoth organism of the American trust. Subordinates are inadequately supervised. There are leakages, wastes and divers mistakes which more than outweigh the advantages resulting from the elimination of certain intermediary agents and from a more perfect division of labor, no matter how beneficial the formation of the trust may be in this latter respect. Nor, generally speaking, does the trust influence prices as much as has been imagined — at least, not in any permanent way. For if it keeps them too high it reduces consumption, and it feels the effect of this the more keenly because its capital almost always is "watered," or, to put it otherwise, very much inflated.

According to the census of 1900 there were in the United States in that year 185 "industrial combinations," resulting from the fusion of 2,160 formerly distinct establishments, of which 2,040 were in operation during the census year. The total capital of these 2,160 establishments, calculated as the "Report" calculates all industrial capital — that is to say, by adding together the value of the land, buildings, equipment, cash on hand, outstanding bills, raw materials, materials in process, etc.— aggregated $1,461,000,000, or a little more than one-seventh of the total industrial capital of the United States, certainly a very high proportion. But the total par value of the capitalization authorized by the charters under which the various combinations were formed was no less than $3,619,000,000, of which $3,093,000,000 had been issued. Does this mean that half the capital of the trusts of the United States was "water" in 1900? This is hardly the case, for a large part of the difference between the $3,000,000,000 issued and the $1,461,000,-

000 of actual industrial capital represents capital appropriated to enterprises of a commercial character which the trusts operate side by side with their industrial enterprises. But even so, there is unquestionably no scarcity of "water."

The census statistics also show that in 1900 trust establishments gave employment to 400,046 people, to whom a total of $195,000,000 was paid in wages. This is one-thirtieth of the workmen and one-twelfth of the aggregate of wages in the industrial establishments of the country. The gross value of the trust output was $1,667,000,000, or about one-eighth of the total product value.[1] All this shows very clearly that if the trusts play an important role in production it is far from being so important as is sometimes thought to be the case.

It is quite true that since the latest census was taken a number of new trusts have been formed, notably the steel trust and the shipping trust, the two most famous in Europe. But everybody knows that the results obtained by these two colossal combinations can hardly be called brilliant. And this may be said of the great majority of trusts. The statistics of dividend payments give ample proof, if proof is required. The enormously "watered" capital of $3,093,000,000 is composed of $216,000,000,000 worth of bonds, $1,066,000,000 worth of preferred stock and $1,810,000,000 worth of common stock. Now, of the 185 trusts listed in the "Report" 117 had paid no dividends on their common stock during the census year, 5 had declined to give any information to the census officials, only 63 had distributed anything, and 31 of the 63 had no preferred stock. Thus, of 154 trusts having both preferred and common stock, only 32 paid anything on the latter.

[1] The fact that the trusts make a better showing in respect to product value than in respect to number of employees need cause no surprise, for the trust form of organization is most frequently found in those industries in which the use of machinery is carried to the utmost limit possible, and in which, as a consequence, less labor is required to obtain a given product value.

According to more recent statistics in the New York World Almanac, of 213 "industrial combinations," having a capital of $1,116,000,000 worth of bonds, $2,092,000,000 worth of preferred stock and $3,639,000,000 worth of common stock — the increase since 1900 is self-evident — only 51 paid dividends on the common stock in 1902 and 13 of the 51 had no preferred stock. With such a showing is it at all surprising that the public does not greedily accept the paper of the trusts?

And all this despite the fact that the last few years have been years of extraordinary prosperity. The trusts, and particularly the steel trust, have been able to secure heavy orders from railroad and other companies — whose increased operating expenses are perhaps in part explainable by this fact — thanks to subscribing, in their turn, for stock in these companies. What will happen when the lean years come?

There is scarcely room for doubting that the trusts will then collapse with a resounding crash. Europe, as I have already said, has allowed herself to be unduly alarmed by these excrescences on the too full-blooded industrial body. In the development of American industry they do not in reality, play the role attributed to them, they have never played it, and I do not think that they will play it in a near future. With few exceptions, such as the Standard Oil Company which enjoys a quasi-natural monopoly, they are ephemeral organisms, resting on an enormous abuse of paper, whose ability to weather adversity is feeble and whose influence is much more seeming than real.

Already, business having begun to slacken since the middle of 1903, the trusts are staggering and falling on every hand. The operation of passing to the public masses of exceedingly inflated paper could continue only for a time, and even in the case of the most apparently substantial trusts, could not be carried out so effectively

as the operators had fondly hoped. Thus, the shipping trust is seen to be in a pitiable condition. Even the steel trust has been rudely shaken.[1] Allow me to recall the manner in which this fantastic combination was formed. It absorbed ten constituent companies, whose names and amount of capital issued were as follows:

	Capital (In millions of dollars.)	
	Common stock.	Preferred stock.
American Bridge Co.	30.5	30.5
American Steel Sheet Co.	24.5	24.5
American Steel Hoop Co.	19	14
American Steel & Wire Co. of New Jersey	50	40
American Tin Plate Co.	28	18
Carnegie Co.	78.4	78.4
Federal Steel Co.	46.5	53.3
Lake Superior Con. Iron Mines.	14.7	14.7
National Steel Co.	32	27
National Tube Co.	40	40

Each of these companies was already a trust in the particular branch of industry represented by it. The American Bridge Company was the result of the fusion of 26 distinct companies and made 90 per cent of the bridges built in the United States; the American Sheet Steel Company had absorbed 26 companies; the American Steel and Wire Company, 27. The American Tin Plate Company produced 95 per cent of the country's tin plate supply; the Carnegie Company and the Federal Steel Company had each absorbed a large number of railroad companies, mines and steel works; the National Steel Company represented the union of 6 or 7 companies; the National Tube Company united in itself 17 companies. All these trusts were greatly over-capitalized. Yet the capital of the United States Steel Corporation — the steel trust — which acquired all of them, was, with its $508,495,000 worth of common stock, its $510,314,000 worth of preferred stock and its $303,450,-

[1] It is important to bear in mind that M. Leroy-Beaulieu's book was written in 1904, and that as a consequence his observations are not always exactly applicable to conditions since obtaining. — H. A. B.

000 worth of bonds, much larger than their total capital. It is easy to imagine the quantity of "water," to use the American expression, that was poured into these stupendous sums.

Proof that the capital of the steel trust had been outrageously inflated was not long in forthcoming. In its first year of operation, a year of phenomenal prosperity in the metal industry, with the factories unable to fill orders and the companies able to secure whatever prices they saw fit to demand, the steel trust paid only 4 per cent to the holders of common stock, while those holding preferred stock received but the 7 per cent to which they were entitled by the charter under which the trust was formed. Moreover, modest as was the dividend of 4 per cent for a time of such exceptional activity, it appears to have been paid at the expense of meagerly endowed reserve funds. Still further, scarcely was the trust formed before the difficulties inherent in such combinations began to make themselves felt. It wished to maintain prices. That was its main purpose, its avowed *raison d'être*. But tho it controlled three-fourths of the steel production of the country, it was obliged to meet competitors, some of which gave it much trouble, while others cut prices merely in the hope of being bought out at a high rate. With these difficulties increasing and coming to the knowledge of the public, it is not surprising that the company's stock steadily depreciated in value, particularly from the moment when the public began to realize that the period of prosperity was not going to continue for ever.

The few figures which follow will suffice to indicate the losses sustained by those enthusiasts who hastened to purchase shares in this much boasted and so redoubtable a trust.

PRICE FLUCTUATIONS OF UNITED STATES STEEL CORPORATION SHARES.

	Common stock.		Preferred stock.	
	Highest.	Lowest.	Highest.	Lowest.
1901	54	36	102¾	87
1902	48¼	31	100	82
1903	40⅞	10	92½	49¾

On May 10, 1904, common stock was quoted at 10 and preferred stock at 55. The 5 per cent bonds, having a par value of 100, could be purchased for 72.[1]

The decline was all the more rapid after the middle of 1903 because the first indications of an approaching economic depression then became apparent. The trust's profits during the first quarter of 1903 had already been appreciably less than the profits of the corresponding period for the preceding year. During the second quarter they rose almost to the same level, but the third quarter saw them again fall sharply, while the fourth witnessed a still greater decline. Hardly any surprise was felt, therefore, when the third and fourth quarterly dividends were cut to ½ per cent, or at the rate of only 2 per cent per annum. At the prices current at the time of writing the return on the common stock would, however, be 20 per cent, and that on the preferred stock 12½ per cent. Bearing in mind that the latter is composed of 7 per cent cumulative shares, this rate of interest, as well as that on the bonds, amounting at the market price to 7 per cent, is eloquent testimony to the distrust of the public.

This distrust would seem to be only too well based. The idea of maintaining the prices of metal products against wind and tide has always appeared to thoughtful men to be chimerical, and it is now becoming more and

[1] As is well known there has since been a noticeable advance in United States Steel shares and bonds. At the moment of translation the common stock was quoted at 38¼, the preferred at 105¼ and the 5 per cent bonds at 98¼. Despite this, M. Leroy-Beaulieu in a recent letter to the translator takes occasion to reiterate his belief that "it would be difficult for the said trust to steer through a severe and prolonged period of depression."—H. A. B.

more generally recognized as such. From July, 1903, to the time of writing, the price of pig iron has fallen 40 per cent, and a number of blast furnaces have been shut down. On account of a falling off in orders — which were superabundant so late as the spring of 1903 — the trust itself has decided to close several of the Carnegie Company's plants for the time being. From August, 1903, to December of the same year, the monthly production of pig iron fell from more than 1,600,000 tons to less than 1,000,000 tons. Since then it has risen slightly, and efforts are being made to maintain it by exporting iron and steel articles on which, in December, 1903, a 33 per cent reduction in freight rates from Pittsburg to New York was obtained from the railroad companies. But sales abroad are much less profitable than domestic transactions. On all sides business appears to be slackening. Numerous and serious strikes which have followed one another in rapid succession since the great strike of the anthracite coal miners, have provoked uneasiness which has been increased by the stoppage of a large proportion of the cotton mills — one-twelfth of the spindles it is said — as a result of increased cost of the raw material. The mining companies are reducing the output of coal. The railroad companies are ordering fewer new cars and less material for the construction of bridges. In short, it would seem certain that consumption which, despite the enormous progress of production, has advanced abreast of, or even in advance of the latter, is lagging behind it today.

Once such a movement begins it is difficult to put an end to it. There is even room for fearing that it will become more and more rapid. And acceleration might be fatal did poor harvests intervene, which must happen some time or other. With their inflated capital, the trusts cannot be expected to withstand a noticeable depreciation of business, and the falling off is more than

astonishing after a "boom" which carried the production of pig iron, to cite an example, from 9,800,000 tons in 1897 to 17,800,000 tons in 1902. Is it not evident that the consumption of a country, even though this country be the United States, cannot increase at a similar rate?

Doubtless, however, some business men imagined that it would increase indefinitely and without intermission. Such an one was the French or French-Canadian financier, F. H. Clergue, the organizer of the Consolidated Lake Superior Company, which went to pieces in 1903 and which was a typical trust. Formed with the assistance of considerable American capital and a number of American capitalists it proposed to acquire or to create ten or twelve industrial enterprises on the banks of the St. Mary's river, which empties the waters of Lake Superior into Lake Huron. The company, wrote the New York correspondent of the London Economist, took in hand several lines of electric street-cars, some lighting and power houses, a paper and wood pulp factory, two hundred miles of railway line connected with mines; two blast furnaces and a steel mill. It also channeled a waterway from which could be obtained 60,000 horsepower, and secured timber concessions from the Canadian Government.

Speedily it was predicted that there would rise in the extreme north a new industrial empire rivaling that of Pittsburg. But one day the trust found it necessary to borrow $5,000,000. It already had a floating debt of $1,500,000, and its offspring in their turn owed some $5,000,000 or $6,000,000 more. A syndicate of New York bankers agreed to advance the required sum, taking as security the bonds and stock of the subsidiary companies. But when the loan matured, despite the fact that they had as guarantee all the shares of the subsidiary companies, on which more than $30,000,000 had been

spent, and which represented the assets of the $100,000,000 trust, the bankers refused renewal and the Consolidated Lake Superior Company promptly went into liquidation. This is the sort of thing that brings the inflation of trust capital into vivid relief. *Ab uno disce omnes,* we might add. If all trusts are not similarly constituted, certainly the great majority are. So we may expect to see them fall, one after the other, like rows of tin soldiers.

Undoubtedly, however, the substantial foundations of American industry will be uninjured. And, no matter what may happen, the American iron and steel industry, in particular, will remain the first, the most powerful and the most progressive of all iron and steel industries in the world. But it cannot be questioned that the extravagances of the "trustomaniacs" will have far reaching effects. We shall feel the reaction in Europe in different ways but, in all likelihood, chiefly under the form of an invasion of American goods. Home consumption will be insufficient to keep their enormously increased machinery in operation, and consequently the Americans will seek to sell in foreign markets a considerable quantity of iron, of steel, and probably of many other articles. Europe, therefore, will not only be hard pressed to defend herself at home but will have to meet increased competition in the markets to which she exports and some of which she will be in danger of losing altogether. In a word, Europe should carefully prepare herself against a time when the industrial competition of the United States will be fully as formidable as has been the agricultural competition.

CHAPTER IV.

THE MOTIVE FORCES OF AMERICAN INDUSTRY

One of the best means of gauging the importance of a modern manufacture is to ascertain the amount of motive power of which it makes use. Until about the end of the eighteenth century, outside the muscular strength of man himself, only waterpower and, more rarely, windpower were utilized by industrial establishments. And both of these were utilized in only a small number of industries, chiefly in milling. The development of steampower, with its enormous augmentation of the energy at the disposal of man, may truly be said to have created modern industry. At the same time improvements effected in the means of transmitting energy made possible the adaptation of waterpower itself to a much larger number of industries. As a result of these discoveries the factory hand ceased to be, or at any rate was to a far more limited extent, a producer of power, and became instead a director and a distributer of power. Consequently the productivity of a factory, depending as always on the power it finds available, is measured today less by the number of workmen to whom it gives employment than by the amount of steampower or waterpower which it utilizes. A factory with imperfect machinery, or in which many operations are still executed by hand instead of by machinery, will employ more workmen and less machinery and will have a smaller output than one in which the use of machinery is carried to the utmost limit possible. To resume: Towards the close of the nineteenth century the employ-

ment of electricity had the effect of still further ousting man as a producer of power. Simply pressing a button, or turning a knob, which can be done with the end of his finger, one man accomplishes today by the aid of electricity tasks which half a score, perhaps a hundred men would have found difficulty in accomplishing a hundred years ago. It is, therefore, more important than ever to learn the amount of power employed by an industry in order to evaluate that industry correctly.[1]

According to the census of 1900 the aggregate motive power employed in manufacturing establishments of the United States was 11,300,081 horsepower, as against 5,954,655 horsepower in 1890, 3,410,837 horsepower in 1880 and 2,543,818 horsepower in 1870. The increase has thus been most rapid during the decade 1890–1900 — 90 per cent, as against 75 per cent from 1880 to 1890 and 45 per cent from 1870 to 1880. But since the statistics collected by the census relate only to power used in manufacturing operations and do not include any portion of the power otherwise employed, even the above figures do not give an altogether complete idea of the increasing utilization of the forces of nature by the people of the United States. In fact, power is yearly becoming more and more freely utilized for other than manufacturing purposes. For example, there were in 1900 more than 1,200 electric railway lines in operation in the United States, securing their motive power from plants having a total capacity of about 1,000,000 horsepower. There were also, says the "Report," more than 3,300 central stations for the distribution of electric current for light-

[1] The diminution in muscular fatigue, an unquestionable result of the employment of machinery, is by itself a gain of no small value. I hardly think it necessary to pause to refute the erroneous belief — still too generally entertained in Europe, though held scarcely anywhere in America — that the more machinery is employed the less opportunity there will be for the workman. It may possibly be correct in the case of a given industry, or, rather, a given industrial establishment. But, taking manufacture as a whole, the use of machinery undoubtedly creates a host of new industries, enlarges old ones by reason of the cheapness of the product, and has the effect of positively increasing the demand for labor.

ing and power purposes and the total amount of energy utilized to generate this electricity was about 1,500,000 horsepower. Moreover, there are many private electrical plants in hotels and in "sky scrapers," the name given to those enormous structures of twelve, fifteen and even of twenty stories and containing several hundred offices, to be found in the lower part of New York, in the heart of Chicago, in fact, in the business sections of all American cities of any importance.

To give a concrete illustration, the "Report" mentions a sixteen story building containing 560 offices. In this building there are four engines, three of 150 horsepower each and one of 75 horsepower, which are used to drive dynamos. There are also four small engines, totalling about 50 horsepower, connected to ventilating fans. For the hydraulic elevator service there are five pumps totalling 435 horsepower. Altogether, this one office building utilizes more than 1,000 horsepower. To be sure, a part of the equipment is reserved for use only in emergencies. But not less than 700 horsepower is used continuously in the building. Large as is this amount it represents nothing out of the common in the office buildings of the United States. Unfortunately, there is no way of estimating, even approximately, the total amount of horsepower used in this way.

Steampower is likewise employed, either by direct application or in the form of electricity, in mining and quarrying (which are not included in the volumes of the "Report" dealing with industry) as well as in the sinking of foundations, the construction of buildings, in public works, etc. This application of power to diversified operations has been most noteworthy during the past ten years, thanks to technical progress in the field of electricity. Indeed, it is quite correct to say that if the power utilized in manufacturing establishments represented by far the greater part of the total motive power

employed in the United States in 1890, it by no means did so in 1900. The amount of energy directed into other channels does not, of course, constitute more than, or even, half the total, but it certainly does constitute an important fraction of the whole. So that, as a matter of fact, it is safe to affirm that the total has more than doubled during the past decade.

Keeping these facts in mind, the following table is of interest in showing, from census to census, the principal varieties of motive power employed by the manufacturing establishments of the United States and the proportionate use made of each. As a general thing, the results of the different censuses are comparable, But it should be observed that the steam- and waterpower employed in generating electricity is not taken into account in the statistics of 1900 in order to prevent duplication with the statistics relating to the electrical power thus generated. This duplication was made to some extent in 1890.

MOTIVE POWER USED IN THE MANUFACTURING ESTABLISHMENTS OF THE UNITED STATES IN 1870, 1880, 1890, AND 1900.

	1870.	1880.	1890.	1900.
Number of establishments	252,148	253,852	355,415	512,254
Establishments using motive power		85,923	100,735	169,409
Per cent.		33.8	28.3	33.1
Units of horsepower used (in thousands)	2,346	3,411	5,955	11,300
Average horsepower per establishment	9.3	39.7	59.1	66.7
Steam engines:				
Number		56,483	91,410	156,100
Units of horsepower (in thousands)	1,130	1,225	1,255	1,727
Per cent. of total horsepower	51.8	64.1	76.9	77.4
Gas engines:				
Number				14,884
Units of horsepower (in thousands)			9	144
Per cent. of total horsepower			0.1	1.3
Water wheels:				
Number		55,404	39,008	39,182
Units of horsepower (in thousands)	1,130	1,225	1,255	1,727
Per cent. of total horsepower	48.2	35.9	21.1	15.3
Electric motors:				
Number				16,923

	1870.	1880.	1890.	1900.
Units of horsepower (in thousands)	.....	.....	16	311
Per cent. of total horsepower	.....	.....	0.3	2.7
Other power:				
Number	.....	.....	.....	2,144
Units of horsepower (in thousands)	.....	.....	5	54
Per cent. of total horsepower	.....	.....	0.1	0.5
Total rented horsepower (in thousands)	.....	.....	89	321
Per cent. of total horsepower	.....	.....	1.5	2.8
Electric rented horsepower (in thousands)	.....	.....	.....	184
All other rented horsepower (in thousands)	.....	.....	.....	137

One of the most surprising features which a cursory examination of this table would seem to develop is the small proportion of establishments making use of motive power, a proportion no higher in 1900 than in 1880. Here, it might be thought, is something contrary to generally accepted ideas concerning the development of large-scale manufacture. Examining the matter closely, however, it will in the first place be perceived that the census of 1890, and still more the census of 1900, made a far more exact enumeration of small workshops than did previous censuses. In the second place the figures show that, as has already been remarked, the development of large establishments does not mean the extinction of small ones; but that, on the contrary, many new factories of insignificant dimensions spring into being for the execution of minor operations, for making repairs, etc. Moreover, it must not be forgotten that though there are many small workshops, giving in the aggregate employment to a great many people, they play but a secondary role in point of production. In connection with this matter nothing is more significant than the statistics relating to hand trades, which account for 42 per cent of the total number of manufacturing establishments but for only 9 per cent of the total product value.

The tendency to concentration, on which I have dwelt at some length in a preceding chapter, is indicated very

clearly by the average amount of energy utilized by the factories of the United States. From 9 horsepower per plant in 1870 the average has risen to 67 in 1900, a more than seven-fold increase in thirty years. The maximum is found in the iron and steel industry, in which the average is 2,508 horsepower per establishment as against 509 in 1880; in the paper and wood pulp industry, in which it has risen, during the same interval, from 179 to 1,002 horsepower, and in the cotton industry, with a gain of from 288 to 840 horsepower as the average per establishment.

Of the different kinds of energy utilized, steam, which was still closely pressed by water so late as 1870, is far in the lead, providing more than three-fourths of the motive power. But it is noticeable that, as the result of the increasing use of new forms of energy in gasolene and still more in electric motors, it made proportionately less advance from 1890 to 1900 than from 1880 to 1890.

The tendency to the use of more and more powerful machinery is only partially shown by the constant increase in the average horsepower per machine (not, be it observed, per establishment), the averages being 39 horsepower in 1880, 51 horsepower in 1890 and 66 horsepower in 1900. As a matter of fact, in addition to the enormous generators furnishing the actual motive power of a large plant, it is frequently found necessary to make use of a number of small ones to supply the machines employed for sundry auxiliary operations. This explains why, for instance, the average horsepower of the engines used in the iron and steel industry is only 235, while in the less complex cotton industry it is as high as 300, the maximum of the various American industries. Of late years the tendency is to make increasing use of electric motors for auxiliary operations, the ease with which such motors may be handled and their great adaptability rendering them excellent for the purpose.

Little need be said of gas and oil engines, which the "Report" includes under one heading. Of recent employment these are chiefly used in small establishments to which they are of no mean value because of their cheapness, their economical production of power, their mechanical simplicity, and the possibility of putting them to many different uses. Altho nowadays some very powerful engines of this type are constructed, it seems altogether likely that both gas and oil engines will continue to be employed chiefly in the small workshop. The average amount of energy supplied by them is only 9 horsepower.

The use of waterpower as a motive force shows some interesting fluctuations. Until the middle of the nineteenth century it enjoyed an unquestioned supremacy. Then steampower, more manageable and more to be depended upon, began to oust it so rapidly from large establishments that for a time it seemed as tho it was destined to be used only in small or average-sized factories. From 1870 to 1890, indeed, the increase in the amount of waterpower employed by the industrial establishments of the United States was negligible. From 1890 to 1900 a change was apparent, the increase amounting to 40 per cent. The reason for this lies in the fact that of recent years marked improvements have been effected in the apparatus for utilizing the power obtainable from waterfalls, that colonization has extended to the Rocky Mountain region where waterfalls abound, and that a certain industry, for which waterpower is peculiarly suitable because it is easily obtained in the districts where this industry is carried on, has lately grown rapidly. I refer to the paper and wood pulp industry which is invading, and is exploiting perhaps somewhat prematurely, the forests of New York, New England, Wisconsin and Minnesota. In the state of New York alone the amount of waterpower employed

passed from 65,000 horsepower in 1890 to 191,000 horsepower in 1900. In New Hampshire, Maine and Wisconsin proportionate gains were made.

Even this does not tell the whole story, for the units of horsepower furnished by waterwheels do not fully represent the amount of energy derived from the harnessed waterfalls. To these units must be added a large proportion of the units of horsepower furnished by electric motors, a number of which obtain their energy from waterpower. In 1900 the electric power utilized for industrial purposes alone amounted to nearly 500,000 horsepower, of which 311,000 units were utilized by the owners of the different generators and 184,000 units were derived from central stations. It would be necessary to multiply the total several times in order to obtain an idea of the amount of electric power employed for transportation purposes, for lighting and for a host of sundry other uses. All this makes it clear that waterpower plays a much more important role than a first glance would reveal, and that new possibilities are unfolding for it. Eclipsed for the time being by steampower, it is now hailed on all sides as the motive power of the future.

The increasing use of electricity, which has brought this change about, is the most striking feature of the period intervening between the last two censuses. In 1890 electricity had only made its début. By 1900 it was already supreme in lighting and in urban transportation, and had also begun to be largely employed in divers ways in industry proper. The transmission of electric energy, a discovery of the closing years of the nineteenth century, can be compared in importance with the application of steam to the production of power, rendered practical for the first time at the end of the eighteenth. Thanks to it an enormous amount of energy, which it would be utterly impossible to use at the place of genera-

tion, may be carried hundreds of miles from remote mountain districts to places where it can be advantageously employed to light towns and to provide their inhabitants with transportation facilities. Moreover, in addition to the great dynamos of enormous power which effect these remarkable results, little motors of a small horsepower, even of a fractional horsepower, may be attached to the electric circuits of towns to facilitate the work of the artisan in his home, and perhaps to effect a partial resurrection of certain small industries.

All these varied applications of electric energy flourish in the United States. In the city of New York alone the New York Edison Company distributes 50,000 horsepower of electric energy to a large number of consumers connected with its circuits. At Niagara Falls are two large enterprises entitled, under their charters, to develop 200,000 horsepower from this immense waterfall which, with its 6,000,000 or 7,000,000 horsepower, represents more than the total amount of horsepower utilized in France. Transmitted to Buffalo, a distance of 26 miles from the falls, the electric current thus generated lights the city, propels its street cars and provides motive power for a large number of industrial establishments located in and roundabout it. Still more astonishing, out on the Pacific Slope the waterpower of the Yuba river is transported from the Sierra Nevadas to San Francisco by two lines of wires — one of which is of copper, the other of aluminum — the longer of which is not less than 200 miles in length. These carry a current raised to the enormous pressure of 60,000 volts, the power thus transmitted being equivalent to 16,000 horsepower.

Further north, energy equivalent to 8,000 horsepower is derived from the Snoqualmie falls and carried across the Cascade Mountains, to the youthful cities of Tacoma and Seattle distant respectively 48 and 32 miles. The

transmission is made through aluminum wires at a pressure of 25,000 volts.

The falls thus harnessed in the mountains bordering on the Pacific have only a feeble volume of water, but they possess a truly enormous head. In the case of the St. Mary's river, flowing between Lakes Superior and Huron, both volume and head are extremely small, the drop not being more than 20 feet. The Americans, however, have shown no less ingenuity here. Despite the great activity of navigation on the canal which runs beside the rapids, and over which an annual tonnage far higher than that of the Suez canal is carried, they have been able by means of compensating works to obtain a force of 20,000 horsepower without in any way interfering with navigation. Nor are they without hope of increasing the amount of energy.

To sum up, the United States has not allowed itself to be surpassed by any other country in the use of electricity. Moreover the sources of hydraulic energy which it possesses guarantees it as brilliant a future with this new motive power as with steam. So that, should the increasing utilization of water produce in the course of the century an industrial revolution, the American Union is assured of not suffering therefrom.

CHAPTER V

THE RELATIVE IMPORTANCE AND THE DISTRIBUTION OF THE DIFFERENT INDUSTRIES

Admirably fitted by nature to become the scene of a remarkable industrial development, and peopled by men who are above all others quick to avail themselves of their resources, the United States beholds its vast expanse of territory covered by manufacturing establishments of the most varied kind. Hardly any industry is unrepresented, and hardly any fails to prosper. The census of 1900 recognizes and give statistics relating to no less than 354 different industries. It goes without saying that I cannot examine all of these in the space at my disposal. But, to borrow a simile from the authors of the official "Report" on the census, just as in natural history several allied species are classified under one generic heading, so may one classify the 354 distinct industries into a much smaller number of groups, each of which includes kindred or supplementary industries. The "Report" accordingly classifies the principal industries into 13 groups, to which it adds a group covering miscellaneous industries and one covering the hand trades, or 15 groups in all. Before examining these in some detail, it may be well to survey them as a whole, and for this purpose I reproduce, from the "Report" a table summarizing the most important statistics relative to the several groups as they were conditioned at the time of the three last censuses. After what has been said in preceding chapters, I need hardly add that neither the mineral nor the transportation industry appears in the table:

		Number of establishments.	Capital (in millions of dollars).	Wage-earners (In thousands).	Wages (in millions of dollars).	Cost of materials (in millions of dollars).	Value of Products (in millions of dollars).
Food and kindred products	1900	61,266	938	312	129	1,838	2,274
	1890	41,296	508	249	90	1,319	1,636
	1880	38,427	319	174	52	1,002	1,171
Textiles	1900	30,048	1,367	1,030	342	896	1,637
	1890	16,847	1,008	824	278	705	1,262
	1880	14,137	595	710	198	570	971
Iron and steel	1900	13,896	1,529	734	382	987	1,793
	1890	11,169	998	531	285	618	1,144
	1880	8,823	488	379	161	369	659
Lumber	1900	47,054	946	547	212	561	1,013
	1890	35,576	844	548	202	463	878
	1880	42,336	314	320	96	283	489
Leather	1900	16,989	344	238	100	396	584
	1890	12,918	247	213	98	294	488
	1880	16,208	140	182	71	294	426
Paper and printing	1900	26,747	558	297	140	214	606
	1890	20,160	344	226	118	150	446
	1880	6,044	135	119	53	92	198
Liquors and beverages	1900	7,861	534	63	37	122	426
	1890	4,219	310	48	29	110	341
	1880	3,880	135	39	17	102	167
Chemicals	1900	5,443	498	101	44	356	553
	1890	5,642	323	77	34	240	380
	1880	2,914	114	45	17	113	170
Clay, glass and stone products	1900	14,809	351	245	109	59	294
	1890	11,711	217	221	91	69	230
	1880	10,418	83	133	40	40	108
Metals other than iron and steel	1900	16,305	411	191	97	497	749
	1890	10,019	204	123	64	179	317
	1880	9,801	88	85	39	100	173
Tobacco	1900	15,252	124	142	50	107	283
	1890	11,643	96	123	45	92	212
	1880	7,674	40	88	25	65	119
Vehicles for land transportation	1900	10,112	397	316	165	268	509
	1890	10,175	248	221	118	175	344
	1880	4,472	55	69	28	56	105
Shipbuilding	1900	1,116	77	47	25	33	75
	1890	1,010	53	25	15	17	40
	1880	2,188	21	21	13	20	37
Miscellaneous industries	1900	29,479	1,349	483	203	490	1,004
	1890	19,304	769	303	137	300	646
	1880	11,149	180	189	66	171	311
Hand trades	1900	215,814	392	559	288	483	1,184
	1890	143,716	356	519	288	432	1,009
	1880	75,381	84	179	72	120	264

The table speaks for itself, and shows with sufficient exactness which are the most important industries and which have made the most rapid progress. It will therefore be unnecessary to make any extended comments. Let me observe, however, that it is impossible to gauge an industry correctly by taking note of its product value alone. Certain industries effect very little alteration in the raw materials which they handle, and consequently require comparatively few employees and a comparatively small investment of capital. Such is the case with the food products industry, for example, which stands first so far as concerns the value of the output, but which is far behind the textile, iron and steel, and lumber industries as respects the number of employees and the amount of wages paid. If the product value is extremely high, it is largely composed of the value of the raw material — nearly four-fifths, in fact — and this shows clearly enough that the process change is slight. On the other hand, in the textile, iron and steel, and lumber industries the value of the output is almost double that of the materials employed, showing that the changes effected in process of manufacture are much more considerable. One is almost justified in saying that the difference between the value of the output of a given industry and the value of the raw materials used by that industry — the difference, in short, which indicates what the industry has added to the value of the raw materials — is the true criterion whereby to establish the importance of that industry.

Naturally, manufacturing activity is not the same in all sections of the United States. Unequally favored in point of the supply of the various animal, vegetable and mineral raw materials, and particularly as concerns coal the principal source of motive power; some inhabited for centuries, others for hardly more than a few years: all the states could not possibly display the same degree

of industrial development. The following statistics, borrowed from "Report" tables bearing on this point, will give an idea of the variations in activity according to geographic division. For purposes of comparison I have added the population of each of the divisions:

	N. Atlantic.	S. Atlantic.	N. Central.	S. Central.	Western.	Totals.[1]
Number of establishments —	204,265	47,264	182,467	51,042	27,238	512,276
Capital (in millions of dollars) —	5,300	673	2,902	528	430	9,831
Cost of materials (in millions of dollars)—	3,547	469	2,546	393	392	7,346
Value of output (in millions of dollars)—	6,498	840	4,338	680	654	13,010
Number of persons employed—	2,772,117	497,972	1,537,301	313,418	193,731	5,321,389
Population —	21,046,695	10,443,480	26,333,004	14,080,047	4,091,349	75,994,575

These figures show quite clearly the industrial supremacy enjoyed by the old North Atlantic states in which are concentrated more than one-half the total number of workmen and total amount of capital engaged in manufacturing enterprises, and in which almost one-half the total product value is obtained. As opposed to this the Southern states, despite their recent progress, still play a very unimportant role. The West makes a much better showing than the figures indicate, if to manufacture proper, with which alone the "Report" deals, be added the mineral industry.

The great North Atlantic industrial region is divided into three groups: that of New England, in which the cotton goods industry predominates; that of New York and New Jersey, in which, thanks to the close proximity of centers of heavy consumption, varied industries, for the most part making finished products, have accumulated, and in which the silk industry in particular has

[1] These totals apply to the entire continental territory of the United States exclusive of Alaska, where the industrial development is quite insignificant; but they include some official establishments which were excluded from the statistics already given, and for this reason there are some slight statistical discrepancies. They are so slight, however, as to be negligible.

made rapid progress; and that of Pennsylvania, which is not only the ranking center of the metal industries but which is also prominent in the woolen, glass and ceramic industries. In the Central West, while the metal industries and the manufacture of railway cars and of agricultural machinery are of great importance in Ohio and Illinois, the distinctive characteristic of the region as a whole is the presence of a great number of industries directly based on agriculture, and especially the food products industry. In the South, the metal industry has long been extensively carried on in Alabama, and, during the past ten years, the cotton goods industry has made remarkable progress in the Carolinas and in Georgia. The West, finally, is the region par excellence of the mineral industry. The food products and the lumber industries are also of some importance in, respectively, California, and Washington and Oregon.

Of the different states New York ranks first industrially, with $2,175,000,000 worth of products, $1,651,000,000 of capital invested, and 849,000 workmen. Then comes Pennsylvania, with $1,835,000,000 worth of products, $1,552,000,000 of capital invested, and 734,000 workmen. Illinois has $1,260,000,000 worth of products, $777,000,000 of capital invested, and 395,000 workmen, and disputes third place with Massachusetts, which has only $1,035,000,000 worth of products, but $823,000,000 of capital invested, and 497,000 workmen. These four are the only states with a product value of more than $1,000,000,000. Next to them stand Ohio and New Jersey, which have, respectively, $830,000,000 and $612,000,000 worth of products. Six other states, Missouri, Indiana, Wisconsin, Michigan, Connecticut and California, have a product value of from $300,000,000 to $400,000,000 each. The remaining states have, without exception, a much lower product value.

CHAPTER VI

THE MINERAL INDUSTRY

Not only does the United States far outrank all other countries in respect to mineral production, but its supremacy in this particular sphere of activity is constantly becoming more pronounced.[1] Due allowance being made for statistical duplications and for the value of metals obtained by treating foreign ores, the mineral output of the United States in 1902 aggregated $1,238,000,000 in value. This sum represents, I need hardly say, the value of a great variety of substances, for tin, nickel and platinum are the only metals not extracted in large quantities in the United States, while of non-metallic substances of value nitrates alone are missing. That the reader may understand just how varied and extensive the output is I give on the next page, according to "The Mineral Industry" of 1903, the amount and value (at the point of extraction) of every mineral product in the United States exceeding $2,000,000 in value.

According to these figures the United States leads all countries in respect to the three mineral products which are most essential to modern industry — coal, iron and copper, of which it furnishes respectively one-third, two-

[1] While the ten large quarto volumes of the "Report" constitute a rich storehouse of information concerning the population, agriculture and manufacture of the United States, they contain no statistics relative to the exploitation of the country's mines, this subject, it appears, being reserved for a special inquiry the results of which are unknown at the moment of writing. In preparing this chapter I have had recourse to sundry sources, but more particularly to the useful publication entitled "The Mineral Industry," which is edited annually by the members of the staff of "The Engineering and Mining Journal" of New York, and to which our "Society for the Encouragement of Industry" has awarded a gold medal in recognition of its value to the trade. Consequently, I have no hesitation in saying that the statistics given in this chapter are quite as trustworthy as those quoted from the "Report" in the discussion of the other branches of American industry.

MINERAL PRODUCTION OF THE UNITED STATES IN 1902.

ORES AND MINERALS.

	Metric tons.	Value (in millions of dollars).	Value per ton (in dollars).
Bituminous coal	234,393,529	285.6	1.21
Anthracite coal	37,604,343	83.0	2.20
Clay products	.....	110.2	.....
Crude petroleum	12,174,961	70.6	5.80
Iron ore	35,190,299	64.8	1.84
Building stone (in 1901)	.....	55.6	.....
Natural gas	.....	30.0	.....
Portland cement	3,000,000	16.6	5.54
Other cements	1,236,110	4.1	3.31
Salt	3,029,022	5.7	1.87
Limestone (flux)	9,644,931	5.5	0.59
Phosphate rock	1,488,103	4.6	3.12
Roofing slate (1901)	394,072	4.1	3.15
White zinc	46,929	4.0	85.73
Calcium borate	15,605	2.4	156.03
Copper sulphate	22,119	2.0	91.71
METALS.			
Pig iron	17,890,059	289.3	16.19
Ferromanganese	216,389	13.9	64.01
Copper	277,064	71.1	256.55
Lead	254,489	22.8	89.70
Zinc	143,552	15.3	106.80
Aluminum	3,322	2.3	690.00
Gold (in kilograms)	120,269	80.0	664.60
Silver (in kilograms)	1,726,229	28.9	16.77
SECONDARY MINERAL AND CHEMICAL PRODUCTS.			
Coke	20,947,421	51.9	2.48
White lead	104,011	12.0	115.16
Soda	562,000	10.3	18.31
Ammonium sulphate	65,000	4.3	65.61

fifths and one-half of the entire world's supply. It also leads in the production of petroleum, phosphate of lime, lead, silver, and aluminum,[1] the last of which is regarded by many authorities as the metal of the future, and the demand for which is certain to increase. In the production of gold it is surpassed, tho not by far, by Australia only, and in the production of zinc by Germany alone. Clearly no country has been so richly dowered by

[1] France leads in the production of bauxite, the mineral from which aluminum is chiefly made. But part of the French output is shipped to the United States for treatment.

nature with mineral resources of all sorts, and however high may be our estimate of the qualities of its people it is not unfair to say that the marvelous wealth of the subsoil of the United States contributes perhaps more than aught else to its economic strength.

On the other hand, we must render a tribute to the extraordinary rapidity with which these resources have been developed of late years. Bearing in mind that only so recently as 1880 the United States produced but 83,000,000 tons of coal and 3,800,000 tons of iron — or only one-half the production of England and little more than the production of Germany; and but 27,000 tons of copper — or less than the output of Spain or Chile: it is easy to estimate the progress achieved since then, and to realize the profound change effected in the international industrial situation by the rise of America.

The mineral beds of the United States are far from equally distributed through the country. Glancing at the distribution of only the two most important classes — the combustible minerals and the metals — we find that the greater part of the former, and particularly of the coal supply, is concentrated about the Alleghany Mountains and in the three states located immediately south of the Great Lakes — Ohio, Indiana and Illinois. This region, on the other hand, is poorly supplied with metals, possessing only a few beds of iron ore — three-fourths of which are exhausted — in Pennsylvania, and a few somewhat richer beds of the same ore in Alabama. The metal wealth is found almost exclusively in the West, on the shores of Lake Superior — where immense bearings of iron ores and splendid copper mines are worked — and in the Rocky Mountains, where gold, silver, lead and copper are found in abundance. These great metalliferous regions, however, are sadly lacking in coal, a defect which, in the case of California, has recently been remedied to a certain extent by the discovery of oil. The

vast expanse stretching between the Rocky Mountain and the Alleghany states seems to contain few minerals, with the exception of some coal fields of secondary importance, some really valuable zinc deposits in Kansas, and some oil fields discovered in Texas, near the Gulf of Mexico, little more than two years ago.

Under these circumstances it is not difficult to understand why the states east of the Mississippi are much more important from a manufacturing standpoint than those situated west of the great river. The former are by far the better supplied with fuel, and since fuel is a cumbersome material and, in proportion to its intrinsic value, costly to transport, manufacturing naturally tends to concentrate in those regions where it most abounds. Still further, fuel is much more easily transported on the eastern side of the Mississippi than on the western, because of the proximity of the coal fields to navigable waterways — the Atlantic, the different rivers, the canals, and the Great Lakes; whereas, west of the Mississippi good natural carrying routes are, relatively speaking, few and far between. Great Lakes navigation in particular may be called the key-stone of American industry, for thanks to the presence of these immense bodies of water the iron ores of the Superior region may be transported at a low cost to the blast furnaces located near the coal mines of Ohio and Pennsylvania.

It should be observed, however, that the manufacturing inferiority of the western states promises soon to be much less pronounced. And for two reasons. The first is the discovery of oil fields in California and Texas, and of smaller fields of the same combustible in sundry states situated about the Rockies. The second is the increasing utilization of waterfalls to provide motive power. Nevertheless, the East will assuredly continue to enjoy industrial primacy, for it likewise is not lacking in hydraulic resources.

The coal fields of the United States cover an area of more than 275,000 square miles. The most easterly field, the Appalachian, which ranges along the Alleghanies from Pennsylvania to Alabama, across Ohio, Maryland, the two Virginias, Kentucky and Tennessee, contains 73,000 square miles; the East Inland field (Indiana, Illinois and western Kentucky), contains 60,000 square miles; the North Inland field (Michigan) contains 11,000 square miles; the West Inland field, which stretches from Iowa to Texas, through Nebraska, Missouri, Kansas, Arkansas and Indian Territory, contains more than 89,500 square miles; the Rocky Mountain field, running from the Canadian frontier almost to the Mexican border, contains 45,000 square miles. Last of all comes the small Pacific field, with less than 1,000 square miles. No attempt has been made to appraise the fuel wealth of these fields, but the richest by far, in point both of quantity and quality, appear to be the East Inland and the Appalachian, which contain, and particularly in the Connellsville district, excellent coke and coal and steam coal almost equal to Cardiff. It is estimated that fully 55 per cent of the whole area is workable. Nor does this represent the entire coal supply of the United States. Mention must also be made of the small but extremely valuable anthracite field which covers 500 square miles in eastern Pennsylvania, is much nearer the sea than are the mines of the Appalachian field, and has an average annual output of 50,000,000 tons. Finally, there are some deposits of brown coal which at the present moment are unworked, but constitute a reserve supply.[1]

In 1902 two-thirds of the bituminous coal output of the United States was extracted from the mines of the

[1] In addition to "The Mineral Industry" I have, in studying the American coal industry, made use of the interesting and valuable articles written by the well-known authority M. Ed. Loré; and more especially of his contributions to the May 31 and June 14 and 28 (1902) issues of "L'Economiste français."

Appalachian field, from which were taken more than 156,000,000 of the total 234,000,000 tons mined that year. As the anthracite field is contiguous to this particular field it is evident that this region furnished in all about 200,000,000 tons, or more than 70 per cent of the total American output. The most productive sections are the extreme northern and southern parts of the field, the more productive of these being the northern section in which the output was 89,000,000 tons for Pennsylvania, 21,500,000 for Ohio, 24,500,000 for West Virginia and 5,000,000 for Maryland. In 1880 the aggregate output of these four states was but 28,000,000 tons, and in 1890 only 58,000,000. Today their annual output is close upon 150,000,000 tons. In the southern section 9,500,000 tons are extracted in Alabama. Between these extremities Virginia, Kentucky and Tennessee have an annual output, respectively, of 3,000,000, 6,000,000 and 4,000,000 tons. Naturally, fuel is cheap in all these states. The average price, at the mine, varies (for 1902) from $1.05 per ton in Kentucky to $1.38 in Tennessee. In Pennsylvania and Ohio the average price is $1.19, and in the two Virginias $1.15. For some time back the coal exports of the United States have consisted principally of Pennsylvania and Virginia coal, which will doubtless be shipped to Europe in even more considerable quantities henceforth.

The East Inland field contributes 34,500,000 tons of the total output, 27,000,000 tons being extracted in Illinois and the remainder in Indiana. To be exact, one-half the production of Kentucky should be credited to this field. It is here that prices run lowest, being on the average $1.04 and $1.05 per ton. The North Inland field comprises, as has been said, only Michigan, which has an annual output of 800,000 tons. The extensive West Inland field produces annually only about 19,000,000 tons, the output being distributed among the several

states at the rate of from 2,000,000 to 5,000,000 tons per state. It is in this field that prices are highest, ranging from $1.21 per ton in Arkansas to $1.76 in Indian Territory. An unwooded prairie country, of long, cold winters in its northern part, this region is obliged to depend for its full fuel supply on neighboring and more favored sections. The Rocky Mountain field includes an important producing state, Colorado, which has an annual output of 6,700,000 tons. The nearby state of Wisconsin produces 4,200,000 tons. Utah, New Mexico and the more northerly Montana produce from 1,000,000 to 1,500,000 tons each. The total for this field is thus about 15,000,000 tons. The average price is only $1.23 in Colorado, but it rises to $1.55 in New Mexico. Finally, on the Pacific slope, California and Oregon have virtually no coal, their annual output being, respectively, only 80,000 and 260,000 tons. Washington, however, makes a much better showing, the mines of that state yielding some 2,500,000 tons per year, worth, at the mine, an average of $2.16 per ton. As was observed above, the high price of coal in this section of the United States is one of the great causes of its industrial backwardness.

At first glance one is inclined to be surprised at the cheapness of coal in the great producing states. The wages paid there are so high that it seems incomprehensible that it can be mined and sold at a profit for from only $1.00 to $1.20 per ton and even in certain years, as will appear below, for as small a figure as 80 cents per ton. But here, as in all phases of the industrial and agricultural life of the United States, we find the high cost of labor offset by the extensive employment of machinery. Unlike the mines of Europe the coal mines of America are well equipped in this respect, and the miners, after having at first opposed the introduction of machinery, have welcomed it, so soon as they perceived that not only were the risks of mining lessened thereby, but that,

as M. Ed. Lozé has clearly shown, there was a positive increase in the demand for labor, the resultant increase in production necessitating the employment of numerous auxiliary workmen — loaders, etc. Most decidedly machinery has been the chief factor in the prodigious development of the coal mining industry in the United States.

Of course, account must also be taken of the greater demand born of the continued prosperity of recent years. From 1896 to 1902, that is to say in only six years, the output, including both bituminous and anthracite, increased by nearly 100,000,000 tons, passing from 174,000,000 to 272,000,000 tons. And the increase would have been still more remarkable had it not been for the great strike of 1902, which reduced anthracite production far below its normal level. Had it not been for this interruption the coal mined in this field in 1902 would assuredly have equalled the output of the preceding year, in other words would have been 61,000,000 instead of only 37,500,000 tons, and the total output of the country would thus have aggregated about 295,000,000 tons. The coal output of Great Britain was only 230,000,000 tons in 1898, when it slightly exceeded that of the United States. The output of Germany is only 150,000,000 tons, and this includes 43,000,000 tons of brown coal. The great American federation, in a word, is far ahead of all other countries in point of coal production. Still further, the output would have been much greater had it not been restricted by the inability of the operators to secure adequate transportation facilities. While the railroad companies increased their carrying capacity as fast as possible they were, throughout the recent period of prosperity, unable to meet the demand, and were sometimes so far behind it that the mining companies were obliged to curtail production, not because orders were falling off, but simply because coal was accumulating in their yards.

Since manufacturing now appears to be less active, it is probable that this inconvenience will no longer be felt. On the other hand, it is altogether likely, for the same reason, that the output will not continue to increase as rapidly as in the past. Consequently, it is only to be expected that the producers will begin to pay more attention to the foreign market, which the intensity of the domestic demand has hitherto kept them from cultivating to any great extent. It must be said, however, that the United States has since 1890 constantly exported more coal than it has imported, and the exports have invariably exceeded 1,000,000 tons. Since 1898 they have been increasing rapidly, as may be seen from the following table:

EXPORTS AND IMPORTS OF AMERICAN COAL.
(IN LONG TONS.)

	Exports.		Imports.	
	Coal.	Coke.	Coal.	Coke.
1898	4,503,405	199,562	1,273,706	41,185
1899	5,752,150	280,196	1,400,522	27,855
1900	7,917,519	376,999	1,909,376	103,175
1901	7,383,391	384,330	1,920,248	72,729
1902	6,126,946	392,491	2,551,381	107,437

Thus, estimating a ton of coke as equivalent to one and one-half tons of coal, the exports in 1900 exceeded 8,500,000 tons. Of the 7,917,500 tons of coal proper exported during that year — in which the exports reached a maximum — 5,422,000 tons were shipped to Canada, 223,000 to Central and South America, 664,000 to Japan, 760,000 to Mexico, and only 635,000 to Europe, the remainder going to sundry countries purchasing small amounts. Of the imports of the same year, 1,484,000 tons came from Canada, and mainly from British Columbia. If Eastern Canada obtains its coal supply from the Eastern states, Western Canada in turn supplies fuel to the Pacific slope of the United States, which, moreover, imported 252,000 tons of coal from Australia during

1900. During the same year Europe sent only 199,000 tons to the United States. In 1902, on the contrary, the exports to Europe fell to 187,000 tons, but the imports from Europe rose to 457,000 tons.

It seems little likely that this situation will last, for with a decrease in domestic consumption American producers are certain to engage more and more actively in the export business. And, as has been said, signs are not lacking that the home demand will soon diminish. At the beginning of 1902, according to M. Lozé, it cost from $1.40 to $1.60 to carry a ton of coal from the mines of Pennsylvania and Virginia to the sea, and about $2.00 more to ship it across the Atlantic, making the total cost of shipment from the mine to Europe about $3.40 to $3.60 per ton. But the first of these items may possibly be reduced through an understanding between the mining and the railroad companies, the same capitalists sometimes controlling both the producing and the carrying company. And the second item is likewise susceptible of a reduction, either through the Americans giving effect to the projected shipping bounty, or through better transportation arrangements which will enable coal shipments to become regular instead of being occasional as at present. Again, with a decrease in the domestic demand, there should be a general cutting of prices, which could easily fall from 20 to 25 cents per ton at the mine without being below the prices quoted from 1895 to 1898, when Pennsylvania and Virginia coal cost less than 80 cents per ton.

All these considerations induce the belief that it is quite within the bounds of possibility to see American coal selling in the Mediterranean in the near future at about, if not below, $4.00 per ton. Should this occur the American export trade in coal is bound to assume great importance, and in the Old World as well, doubtless, as in South America, a fierce commercial struggle will ensue

between the producers of the United States and the producers of England. The advantage will be with the former. In consequence of the deepening and the relative exhaustion of the English mines the price of English coal has a general tendency to rise; whereas in America, with the possible exception of the anthracite field, the development of the coal beds has but begun. Accordingly it is quite reasonable to predict that the time will come when, pending the exploitation of the coal fields of China, all the world, with the exception of Northern and Northwestern Europe, which will almost certainly remain customers of Great Britain, will look to the United States for its coal supply.

That country also enjoys primacy in respect to the production of combustible minerals other than coal. These are of two kinds — petroleum and natural gas. The demand for the former is constantly increasing. It is put to three distinct uses. For illuminating purposes it is often found the cheapest form of artificial light. As a fuel it advantageously replaces coal in sections where coal is dear. Finally, the construction of light and convenient " explosion " motors has given it great importance as a source of motive power. While the existence of mineral oils has been known for centuries — the ancient Magi were acquainted with the naphtha fields on the borders of the Caspian Sea — the United States has the distinction of being the first country to place the extraction of petroleum on a business basis. Pennsylvania has had an important petroleum industry for more than forty years, and until twenty years ago the United States provided fully two-thirds of the world's supply of this mineral. But rapidly as the oil fields of the Alleghanies and of Ohio have since then been developed, they have been surpassed by the enormous Baku fields in Russia. In 1898 Russia wrested first place from the United States and maintained its supremacy until 1902 when, thanks

to the discovery of new fields in Texas, the latter regained its long established headship. Today Russia and the United States jointly provide almost the whole of the world's supply. In 1901 the latter produced 8,839,000 tons of petroleum, the former 10,880,000 tons. All other countries together produced little more than 1,500,000 tons, of which about 400,000 came from Austro-Hungary, 300,000 from Roumania, 400,000 from Java and Sumatra, 180,000 from India, 100,000 from Japan, 80,000 from Canada, 44,000 from Germany and 30,000 from Peru. The world's output thus aggregated nearly 21,500,000 tons, whereas in 1897 it had been only 17,500,000 tons, of which 7,831,000 came from Russia and 8,513,000 from the United States. Great as has been the increase, the supply has hardly kept pace with the demand.

In 1902 the American output showed a remarkable increase, totalling 12,175,000 tons, the gain being due, of course, to the development of the Texas discoveries. At the present time there are four enormous oil fields in the United States and a fifth of secondary importance. The following table shows the output of each field for 1898, 1900 and 1902, in thousands of barrels (each barrel containing 42 gallons):

Field	1898.	1900.	1902.
Appalachian	31,625	35,541	30,500
Lima, Ohio	16,578	16,407	16,000
Lima, Indiana	3,751	4,330	7,535
California	2,249	4,250	12,500
Texas	544	800	16,833
Rocky Mountain:			
Colorado and Kansas	738	590	822
Wyoming	3	7	10
Other States	10	30	50
Total	55,500	62,539	84,251

The Appalachian field is the oldest. As the table indicates its production is showing a tendency to fall off

— despite the drilling of some new wells in West Virginia — on account of the exhaustion of the long-worked deposits. The same may be said of that part of the Lima field situated in Ohio relatively near the Appalachian field. On the other hand, development is still proceeding in the western portion of this field. But it is chiefly due to the new fields of California and Texas that the American output retains its great importance. At the same time, it must be noted that with the development of these new fields the character of the output is changing. Appalachian petroleum is pre-eminently adapted for the manufacture of volatile oils, and especially of oils for illuminating purposes. The petroleum of California, on the contrary, is chiefly suitable for fuel purposes, and there is slight inducement to refine it in order to make it available for lighting. Texas petroleum — a discovery of quite recent years, the chief field, the Beaumont, having produced oil only since 1901 — seems to have the characteristics of both Appalachian and California petroleum. Originally it was used almost entirely for fuel. Lately a number of refineries have been built, and it appears feasible to extract from this petroleum a high percentage of illuminating oil, but of oil distinctly inferior to that of the Appalachian field.

All the South-Western states, where coal is very dear, have been greatly benefited by the discovery of petroleum in that region. At first it was sold very cheap in California, bringing at the wells in the neighborhood of Los Angeles and the Kern river only 35, 20 and sometimes only 10 cents per barrel. Even in San Francisco it could be bought at from 50 to 60 cents per barrel. But at that time the necessary apparatus for the substitution of oil in the place of coal had not been constructed to any extent, and the demand was accordingly far below the supply. Prices are now much higher. At the beginning of 1903, "The Mineral Industry" tells us, there

were about 1,000 locomotives burning California petroleum, which had supplanted coal for almost all purposes throughout the state. There are indications that its use as a fuel will constantly increase. Experiments made on American steamers have given favorable results, and several large vessels have already been equipped with oil fire-grates.

But, however helpful the new fields may be in the industrial development of the states in which they are situated, it is evident that they cannot make good the losses in the production of illuminating oil caused by the decrease of the output of the Appalachian and Ohio fields. And on account of the growth of domestic consumption the exports have of late years been maintained only by reducing stocks to the lowest points they have ever touched. In 1902 the oil exports of the United States aggregated 1,064,230,000 gallons, worth $68,500,000. Illuminating oil accounted for 779,000,000 gallons, naphtha for 19,500,000, lubricating oil for 82,000,000, residuum for 38,000,000 and crude petroleum for 145,000,000. In 1901 the exports were 1,079,000,000 gallons, including 827,000,000 gallons of illuminating oil and 127,000,000 gallons of crude petroleum. In 1898 the total was 988,000,000 gallons, including 765,000,000 gallons of illuminating oil and 120,000,000 gallons of crude petroleum.

These figures are significant, for they show that while consumption is increasing the producers of the United States are having the greatest difficulty in supplying their markets with lamp oil. To this condition of affairs, which continues to the moment of writing, is largely due the advance movement shown by Russian oil. Nor can a change be expected unless new sources of volatile oils are discovered in America. A few, indeed, have already been found in California, and, as has been said, a number of refineries have been built in Texas

where the new Sour Lake field, located some twenty miles north of the Beaumont field, appears to yield an oil of superior quality. A number of wells have also been drilled in Wyoming where it is hoped a considerable output will be secured. But unless further discoveries than these are made it is to be feared that the United States will have great difficulty in continuing to sell abroad as much illuminating oil as it has sold in former years.

Natural gas is akin to petroleum in origin and chemical composition. It is found in certain beds of sand not only in North America but in other parts of the world, but is extensively utilized only in the United States where it is put to many industrial and household uses and where entire towns are illuminated and heated by it. Like petroleum, which is carried in gigantic tubes from the point of production to the Atlantic, enormous conduits convey it over great distances, sometimes for a distance of 200 miles. Cleveland and Toledo on Lake Erie, for example, receive a supply from southern West Virginia. In 1902 a greater quantity was consumed than ever before representing, despite the low prices asked and an enormous amount of waste, an expenditure of more than $30,000,000. While the earlier workings in Ohio and Indiana have been almost exhausted, new sources have been discovered in Pennsylvania and West Virginia. Altogether, it seems likely that the people of the United States will continue for some time to come to find in this curious product of the sub-soil an exceptionally low-priced means of heating and lighting.

The metal output of the United States now requires some consideration. Of most importance, in respect both to amount and value of output, is iron, the production of which, in pig iron, totalled 17,890,000 tons in 1902, with an aggregate value of $289,000,000. I shall have more to say concerning the pig iron output in connec-

tion with the metal industries of the country, but at present I must confine my observations to iron ore alone. In the production of this the United States far outdistances all other countries, its output (1902) being over 35,000,000 tons, as against England's 13,500,000, Germany's 8,500,000, Spain's 8,000,000 and France's 4,000,000 tons. Large as is the American output (more than four-fifths of the world's supply) it does not meet the domestic demand, and in the above mentioned year the United States was obliged to import 1,165,000 tons, of which 300,000 tons came from Canada and the greater part of the remainder from Spain, some ores being also purchased from Greece and Algeria. In 1899 the American production was only 25,000,000 tons, in 1890 only 16,500,000 tons, and in 1880 only 7,000,000 tons. Comment on the rapidity with which it has increased would be superfluous.

It is of importance to observe, however, that the increase is now confined to one section — the country about Lake Superior. This is the iron mining region par excellence. South of the lake, in the northern part of Michigan and Minnesota, are five "ranges," or lines of hills, which contain immense deposits. Two of these, the Vermilion Range and the Marquette Range — the latter named after the celebrated French Jesuit missionary, who was the first to explore this part of North America — have had an annual production, for the past four years, of about 2,000,000 tons for the one and 3,500,000 tons for the other. Two other ranges, the Menominee and the Gogebic, have, during the period 1899–1902, increased their annual output respectively from 3,300,000 to 4,600,000 tons and from 2,800,000 to 3,700,000 tons. The fifth, the Mesabi Range, during the same period has increased its output from 6,600,000 tons per year to 13,300,000 tons. Together, the five ranges had an output of 27,571,000 tons in 1902, as

against 18,251,000 tons in 1899. The mines of the Southern states (chiefly located in Alabama) had an output of 4,850,000 tons in 1902, and all other mines (the leading producers being found in Pennsylvania and neighboring states) a total output of only 2,215,000 tons, their production remaining almost stationary. One is tempted to ask whether the ultra-intensive exploitation to which they are submitted will not soon exhaust the magnificent deposits of the Lake Superior district,[1] which is so greatly benefited by the location of the mines near the shore of the lake, whence the ores are shipped directly to the blast furnaces of Pennsylvania. But the Americans, relying on the constant good will of nature, are confident that they will discover either new and productive ranges in this district, or rich deposits in other districts.

Among the remaining common metals, copper holds first place. The production of no other metal has augmented so rapidly, thanks to the constantly increasing demand for electrical apparatus and supplies, for which its extreme conductibility renders copper almost indispensable. And for more than twenty years the United States has outranked all other countries in this branch of the extractive industries. In 1883, out of a total output of barely 200,000 tons, the United States provided 50,000, Spain 45,000, Chile 40,000 and Germany 15,000 tons. In 1902, of a world's supply of 533,000 tons, the United States contributed 277,000, Spain 50,000, Mexico 45,000, Japan 30,000, Australia 29,000, Chile 29,000 and Germany 22,000 tons. The American output comes not only from the celebrated Lake Superior copper mines — the production of which, moreover, shows a constant increase and amounted to 77,000 tons in 1902 — but

[1] Not less than 16,000,000 of the 27,000,000 tons produced in the Lake district in 1902 were derived from the "steel trust's" mines. Moreover, only 35 per cent of the district's output was placed on the market, the remainder being treated in blast furnaces belonging to the mine operators.

also from many mines in the Rocky Mountains, especially from mines in Montana (190,000 tons in 1902) in the northernly section of the Mountain district; and from mines in Arizona (54,000 tons in 1902) in the southerly section. In the same year 11,000 tons were extracted from mines in Utah and California. The remainder of the country's output was drawn from less important mines located in various other states.

The greater part of the output has always been controlled by a limited number of operators. Five mining companies alone furnish about one-half of the American production. In 1902 the Calumet and Hecla Company (Lake Superior) extracted 37,000 tons; the Anaconda (Montana) 34,000 tons — as against an extraction of 60,000 tons in 1897; the Boston and Montana (Montana) 34,000 tons; the Copper Queen (Arizona) 16,500 tons, and the Arizona Copper Company (Arizona) 141,000 tons. As may be imagined, the operators have sometimes effected agreements to keep up the price. But on the other hand, there have occasionally been bitter trade wars between opposing groups. And since the United States, thanks to its enormous output, dominates the world's copper market, these agreements and these wars have resulted in violent fluctuations in the price of copper. The attempts at engrossment have always failed, however, for whenever prices have been artificially heightened by shutting down or reducing the output of existing mines, new mines have been immediately opened by other operators and prices have at once fallen. A striking instance of this is afforded by the situation created in Montana, where the Amalgamated Copper Company and the Heinze interests have engaged in Homeric struggles. However powerful "trusts" may be they cannot conquer nature. To be sure, in the constant and rapid development of electricity there is a sound reason why the price of copper should always be firm. But when the

attempt is made to elevate it above its logical level, the natural result is an increase of production on the part of "independent mines," of which a certain number will always be found; or the stimulation of capital to investment in new mines. Further, when a certain price level has been passed there is an immediate movement in the direction of using other metals — and notably aluminum, of which I have already had occasion to speak — in place of copper.

It would seem that the United States is far from having exhausted its supply of the red metal. While there has been but a slow increase in production ever since 1900, this is simply the result of a voluntary restriction of the output. It may be true that the copper mines of the Lake district (which are among the deepest mines in the world) are showing signs of exhaustion. But so soon as their remarkably pure, however poor, deposits[1] are spent, it will only be necessary to turn to the Rocky Mountains to find a new and rich supply. One mine has recently been discovered in Idaho yielding as high as 9 per cent of copper to the ton of ore, but up to the present lack of transportation facilities has rendered its exploitation difficult. Moreover, the metallurgy of copper is showing enormous progress, and it is now possible to work deposits of a grade formerly unworkable. In this connection mention must be made of the electrolytic process of refining, which permits the recovery of the gold and silver contained in small but appreciable quantities in almost all raw copper. The United States now produces electrolytic copper at the rate of 278,000 tons per year,[2] the by-product containing 27,000,000

[1] According to the statistics of "The Mineral Industry" for the principal mines of the district (exclusive of the Calumet and Hecla, which furnished no information), the return per ton of ore averages a little less than 1 per cent.

[2] This is more than the total output of the American mines, the difference representing the amount of copper derived from the imported ores treated in the United States.

ounces of silver, worth $13,000,000, and 346,000 ounces of gold, worth $7,000,000.

Outside of America only 50,000 tons of copper are refined by this process. But in the United States there is a general tendency to employ none else, even in the case of the Lake coppers, to which it is applied for the sake of the silver they contain. Electrolytic refineries are being built so far west as the Pacific Slope. Although the cost of hand labor and of the greater part of the materials used is 60 per cent more at Seattle or at Tacoma than in the east, says "The Mineral Industry," the operators of the western region believe they can apply the process to fully as great advantage as the operators of the east because numerous waterfalls supply motive power much more cheaply than in the latter section, where it is necessary to use coal. Here is a significant sign of the times, an indication of the industrial displacements which the employment of electricity is destined to bring about.

Copper likewise forms an important item in the export trade of the United States. As a general thing it is shipped abroad after having been worked. On the other hand, a considerable quantity is imported in a crude condition or in the ore from Mexico and Canada. In 1902 the production (including copper in sulphates) was 281,000 tons, the importation 73,000 tons, the exportation 168,000 tons and the consumption 216,000 tons. Stocks were reduced from 96,000 tons on the first of January to 66,000 tons on the thirty-first of December.

The primacy of the United States is not so firmly established in the case of lead as in that of copper, and its output has increased less rapidly. Lead, I may remind the reader, is largely a by-product of the extraction of silver, and it is well known that the silver output has of late years been practically stationary. In 1902 the United States produced 254,500 tons of lead, as against

253,944 tons the preceding year, 207,000 tons in 1898 and 147,000 tons in 1887. Spain, which ranks second, produced 169,000 tons in 1901, Germany 123,000, Mexico 94,000 and Australia 90,000 tons. The other countries contributing to the total output of 893,000 tons were far behind these just named. More than two-thirds (180,000 tons) of the American output is derived from silver-lead ores, being mined chiefly in the great silver producing states of Montana and Colorado and in the Cœur d'Alène district in Idaho.

Large as is the American output it does not quite suffice to meet the home demand. In 1902 the United States imported 96,000 tons (including 31,000 tons of ore to be treated in American smelters) and exported only 72,000 tons of lead. The preceding year, to be sure, the excess of imports over exports was only 11,000 tons. Nevertheless, unless a profound industrial crisis should intervene it is hardly possible that the country will figure as a heavy exporter.

Zinc is one of the few metals in the production of which the United States takes a secondary place, mining only 143,500 tons (1902) as against Germany's 175,000 tons (1901). Belgium has an annual output of 127,000 tons, while France and England each produce about 40,000 tons yearly, the greater part of their production, however, being derived from the treatment of foreign ores, Spanish, Italian, Algerian, etc. Nowhere, on the other hand, has production increased so rapidly as in the United States. In 1897 the American output was only 95,000 tons, as against a German output of 150,000 tons; and in 1882 the American output was only 30,000 tons. The zinc mines of the United States are located chiefly in two districts: the Joplin district, in Missouri and Kansas, producing about 87,000 tons per year; and the Illinois-Indiana district, having an annual output of

45,000 tons. Thanks to its increased production the United States has become an exporting country.

In the production of quicksilver it ranks second to Spain. In 1902 it mined, chiefly in California, 1,195 tons, of which 459 tons were exported. Spain's annual output amounts to about 1,500 tons. The other principal producers are Austria (500 tons) and Russia (400 tons). The total annual quicksilver supply of the world is barely more than 4,000 tons. For some time past the quota contributed each year by the United States has shown scarcely any increase.

Finally, the United States produces 3,300 tons of aluminum, as against 2,500 tons by Switzerland, 1,200 tons by France, 1,100 tons by Germany and 500 tons by England, out of a total production of 7,600 tons per year. It should be said, however, that it imports a great quantity of raw material — 16,000 tons of bauxite, chiefly from France, and 6,000 tons of cryolithe from Greenland — producing at home only 27,000 tons of bauxite. The immense hydro-electric plants near Niagara are largely occupied with the production of aluminum.

The precious metals now demand consideration. Here, again, we find the United States the richest country in the world, the value of its gold and silver output in 1902 amounting to not less than $113,000,000,[1] while Australia (including New Zealand), which ranks second, had an output of only $90,600,000. The secret of its supremacy lies in the fact that it is the one country which is at once a great producer of gold and a great producer of silver. Scarcely anywhere save in the American Cordilleras — chiefly in the United States, and to a smaller extent in Mexico and Peru — have rich bearings of gold and silver been discovered interlocking one another, so

[1] In this total the silver output is appraised not at its monetary but at its commercial value, which is only about 40 per cent of the monetary value.

to speak. Considering the two metals separately, it is found that the United States, with a gold output (1902) of slightly more than $80,000,000, is surpassed by Australia with an output of $85,000,000. It would also rank below the Transvaal, were it not for the ill-omened South African War, the effects of which are still felt. One result of the struggle was to reduce the gold output of the old South African Republic to less than $36,000,000 in 1902. In 1903 it showed an increase, but only to $60,000,000. All other countries are far outdistanced by Australia, the United States and the Transvaal. In 1902 the Russian Empire mined only $25,000,000 worth of gold, Canada $21,000,000 worth, Mexico $11,000,000 worth and India $10,000,000 worth. The output of other countries was quite negligible. Thus, of the world's output of 1902 ($298,412,993) the United States produced more than one-fourth.

In respect to silver the United States, with an output in 1902 of 1,726,229 kilograms worth about $29,500,000, is surpassed, and that slightly, by only one country, its neighbor Mexico, which during the same year mined 1,803,438 kilograms, the commercial value of which was more than $30,000,000. The production of the United States, it may be added, is more than one-third of the world's supply, which in 1902 was 5,121,000 kilograms, worth $86,216,294.

It is well known that gold in appreciable quantities was first discovered in the United States in 1848, when rich " strikes " were made in California. The " placers " of that state soon yielded great wealth, the country's output attaining its first maximum in 1866 with a value of $53,500,000. The bearings becoming exhausted and few new ones being found, the output declined to $33,500,000 in 1874 and 1875, rose for a moment to $51,000,000 in 1878, but only to fall again to $30,000,000 in 1883. Until 1892 it oscillated between $30,000,000 and

$35,000,000. Throughout this period California was the leading producer, the more easterly Rocky Mountain states being richer in mines of silver than in mines of gold. Suddenly, beginning with 1893, rich veins were found in Colorado, a discovery which came just in time to save that state from the disastrous effects of the fall in the price of silver. The development, in particular, of the marvelous Cripple Creek deposits, located at an altitude of 9,000 feet, and of a number of other bearings along the Rocky Mountain chain, advanced production by leaps and bounds. By 1896 the output amounted to $53,000,000, or almost the figure of 1866. The following year the long-standing record was broken, and in 1900 not less than $78,159,000 worth of gold was mined. Since then the output has increased very slowly, the value of the gold mined in 1902 being only $79,992,000. In 1903, from accidental causes, and more especially on account of labor disturbances, production was reduced to about $73,500,000.

Silver mining has been conducted in the United States, on a large scale, only since 1868, when 48,000 kilograms were produced, worth a little more than $2,000,000. Since then this extractive industry has made uninterrupted and truly colossal progress. In 1870, 400,000 kilograms were mined, worth $16,000,000 at par value; in 1880, 935,000 kilograms, worth $39,000,000 at par value but, the decline in the value of silver having already begun, worth only $35,000,000 at the market rate; in 1890, 1,695,000 kilograms, worth $70,500,000 at par and $57,000,000 at the market rate; in 1892, 1,975,000 kilograms — the maximum amount mined in any one year — worth $82,000,000 at par and $55,500,000 at the market rate. The following year President Cleveland obtained from Congress a measure authorizing the discontinuance of the silver purchases which a law of 1878 had required the Treasury to make, and in the

making of which the government had exhausted itself in efforts to sustain the price of the metal — an impossible task in view of the natural depreciation due to overproduction. With the closing of this important market, the price of silver fell still further, a number of mines were closed, and, in 1894, the output dropped to 1,565,000 kilograms. But, so rich and extensive are the Rocky Mountain bearings, so great has been technical progress, and so productive are the new veins that have since been located, that production once more increased quickly, and since 1895 has fluctuated between 1,680,000 and 1,800,000 kilograms. The price of silver has continued to fall, however, and the output of 1902 had a commercial value of only $29,500,000.

The following table shows at a glance how the production of the precious metals is distributed among the several principal mining states:

PRODUCTION OF GOLD AND SILVER IN THE UNITED STATES IN 1902.

	(In dollars.) Gold.	(In dollars.) Silver. (Commercial value.[1])
Colorado	28,466,207	8,176,602
California	16,790,634	469,857
Alaska	8,345,099	47,987
South Dakota	6,964,798	177,344
Montana	4,373,173	6,907,966
Arizona	4,111,945	1,587,281
Utah	3,594,224	5,649,815
Nevada	2,895,020	1,954,018
Oregon	1,816,500	48,665
Idaho	1,474,846	3,053,864
New Mexico	531,074	238,476
Washington	272,141	322,870
Southern States	318,400	232,738
Other States	38,839	81,316
Total	79,992,800	28,948,800

Gold mining is exceedingly well organized in the

[1] The average commercial value of silver in 1902 was 52.16 cents per ounce troy.

United States, the latest mechanical improvements being applied to the placers of California and Alaska as well as to the Rocky Mountain mines. Consequently the cost of extraction is quite low, despite the high cost of labor, which is a more important item in the gold fields than anywhere else. Even old deposits well above the beds of the present rivers are worked in California, enormous dredges extracting as much as 2,000 tons of gravel per day, containing sometimes only 30 or 40 cents worth of gold per cubic yard but workable at a profit thanks to the hydraulic installations. In Alaska, at the Alaska Treadwell mine, one of the largest in the world, there were treated during 1901–1902, 682,893 tons of ore which yielded $1,304,720 worth of gold, or $1.91 to the ton, the total expense of treatment averaging only $1.28 per ton. Bearing in mind that it is impossible for the most economically operated mines in the Transvaal and Australia to reduce their expenses below $4.00 per ton, it is quite evident that, however favorable be the conditions under which the Alaska Treadwell mine is worked, its management have achieved a veritable industrial triumph in reducing the cost of production to such a low level.

It may be said, in passing, that at the present moment the great aim of the American gold mining companies is to reduce expenses, the principal bearings having for two or three years shown signs of exhaustion. In the famous Cripple Creek district, for example, some of the richest mines are already spent. Others are nearly so, and the same is true of mines in other districts. Unless new gold fields are discovered — which is always possible — it seems likely that the American output of this precious metal will remain stationary or will increase only by means of technical progress rendering it possible to work poorer deposits. So far as concerns silver, on the contrary, it may be said that this metal is found in

such abundance that there is room for believing that if production is not actually increased it will easily be maintained at its present level.

CHAPTER VII

THE IRON AND STEEL INDUSTRY

Of all American industries none holds such interest for the outside world as does the manufacture of iron and steel. This is due to several reasons — the extreme rapidity of its development, the extent to which it is threatening to compete with the metal works of Europe, and the formation of the gigantic "steel trust," which controls the greater part of the output and the capitalization of which — more than $1,000,000,000 — dazzles the imagination. Still more important, as at present organized the iron and steel industry may be regarded as the type par excellence of trans-Atlantic industrialism, for in it one finds united all the factors which have contributed to the success of the American people as a manufacturing nation — great natural wealth, extreme concentration, the use of the most improved machinery, and competency both of management and labor.

I cannot give a better idea of the evolution by which the iron and steel manufacture of the United States has attained its present pre-eminence, than by reproducing the brief table in which the "Report" sums up the principal statistics relative to its progress since 1870:

	1870.	1880.	1890.	1900.
Number of establishments.....	808	792	719	669
Capital (in millions of dollars)..	121.8	209.9	414.0	590.5
Salaried employees	.....	.....	4,325	9,217
Salaries (in millions of dollars).	.....	.....	6.5	11.7
Wage-earners	77,755	140,798	171,181	222,607
Wages (in millions of dollars)..	40.5	55.5	89.3	120.8
Miscellaneous expenses (in millions of dollars).....	.....	.....	18.2	32.3

	1870.	1880.	1890.	1900.
Cost of materials used (in millions of dollars)	135.5	191.3	327.3	522.4
Value of products (in millions of dollars)	207.2	296.5	478.7	804.0

It should be observed that the values given in the statistics for 1870 are in paper dollars which in that year were at a considerable discount, the average premium on gold having been about 25 per cent during the year preceding the taking of the census. To put it otherwise, five paper dollars were worth four gold dollars. For comparative purposes, therefore, it is necessary to reduce the values in the first column by one-fifth.

What the table shows first of all, and most strikingly, is the rapidity with which concentration of production has taken place. The number of establishments has constantly diminished, while all the other factors — capital, employees, wages, cost of materials used, and product value — have steadily increased. The average establishment of today is thus much larger than was the case in 1870, 1880 or 1890. This is not the result of the "trust" system, for by referring to the definition of the term "establishment" as set forth by the "Report" and given by me in the first chapter on the manufactures of the United States, it will be found that as a general thing the trust, whose action is chiefly financial and commercial, does not affect the industrial individuality of the establishments it controls. The true cause is, on the one hand, the disappearance of a large number of small plants unadaptable to the conditions of modern manufacture; and, on the other, the enormous growth of the large plants, which have greatly augmented their productive capacity.

It is in production, indeed, that the most marked progress is seen — 3,263,000 tons in 1870, 6,487,000 tons in 1880, 16,264,000 tons in 1890 and 29,508,000 tons in 1900. Thus the output has increased amost ten-fold,

while there has not been a three-fold increase in the number of persons employed in the industry. This means that a workman is today capable of producing three times as much as he could produce thirty-five years ago. Since the muscular strength of man has not increased, and since the number of hours of work instead of increasing show a positive decrease, it is evident that machinery is being employed more and more extensively and effectively.

Keeping in mind the depreciation in the value of money thirty-five years ago, it is also evident that the amount of capital invested in iron and steel manufacture has increased six-fold since 1870. From 1870 to 1890 the increase was more rapid than that of the value of the output. Since 1890 the reverse has obtained. This indicates that the new capital invested during the past decade has been more productive than was the capital invested during the two preceding decades — which corresponds with greater technical progress.

From 1880 to 1890 and from 1890 to 1900 the sum paid in wages increased more rapidly than did the number of wage-earners. This means, of course, an increase in the rate of wages. As a matter of fact the increase has been higher than the figures show, because in 1880, and to some extent in 1890, the census enumerators included as wage-earners a number of employees who were really on salary and whose compensation swelled enormously the total amount paid. The census of 1900 took pains to be more exact. From 1870 to 1880 — reducing the values for the former year to their equivalent in gold — the sum paid in wages increased by 72 per cent. Estimating on a paper money basis for 1870 the increase was only 37 per cent. The first increase (72 per cent) corresponds almost exactly with the increase in the number of wage-earners (81 per cent) from 1870 to 1880. The increase of 37 per cent, on the contrary,

is so far below the increase in the number of wage-earners that it indicates that a very sharp fall in the rate of wages occurred between 1870 and 1880. Now, there is no reason for believing that such a fall actually took place, and we thus obtain confirmation of a theory of which mention may well be made in passing — viz.: the theory that wages, as well as all prices, tend to be based not on the nominal but on the real value of money, as expressed in gold. In short — and however trite this observation may be it is always useful in replying to detractors of modern society — since wages have risen and prices have fallen there can be no question but that under the present industrial system the wage-earner is far more comfortably situated than was the wage-earner of other years.

The iron and steel industry roughly falls into two great divisions. The first comprises the production of pig iron, which is manufactured today in blast furnaces fluxing the iron ore at a very high temperature; the second the conversion of the pig iron into commercial iron and steel, and the fabrication, by the aid of the metal thus obtained, of finished articles of all sorts. The best gauge of the status of a country's metal industry is the amount of pig iron it produces and the proportion of pig iron converted into steel, which is far superior to iron and which may be substituted for iron for most purposes to which the latter is put, notably in the manufacture of rails, in shipbuilding and in the construction of factories, warehouses, office buildings, etc. Thus it is taking the place of iron just as iron in its day took the place of wood.

The United States has for some years produced more pig iron than any other country in the world. In 1870 its production was only 1,833,000 tons and in 1880 only 3,376,000 tons, but by 1890 it had an annual output of 8,845,000 tons and had wrested first place from

Great Britain. In 1900 the production was 14,450,000 tons. These figures are taken from the census statistics. According to trade journals the production of 1902 was not less than 17,890,000 tons, or more than 40 per cent of the world's supply which aggregated about 43,000,000 tons. It is well known that France produces annually not more than 2,500,000 tons of pig iron and Belgium scarcely 1,000,000. Germany and Great Britain, the principal European producers, do not have a joint output equal to that of the United States. In 1902 the production of Germany was 8,400,000 tons, the largest output she has ever had in any one year; and that of Great Britain 8,000,000 tons, as against a maximum of 9,500,000 tons in 1899.

Perhaps nowhere than in the manufacture of pig iron can a better idea be obtained of the extent to which the principle of concentration has been adopted by the industries of the United States; of the increase effected in production by the use of improved machinery, and of the fall in prices that has resulted therefrom. Side by side with the enormous increase in the output is found a decrease in the number of blast furnaces which, including both those active and those idle, totalled 681 in 1880, 559 in 1890 and only 399 in 1900. The total number of wage-earners was 41,695 in 1880, 33,415 in 1890 and 39,358 in 1900. Comparing these figures with the statistics relative to the iron and steel manufacture as a whole, the influence exercised by machinery at once becomes apparent. In the basic branch technical progress has brought about a slight diminution in the number of workmen employed. But in the industry as a whole the number has increased by 60 per cent. This indicates that every invention creates new branches of a given industry, and that the workmen thus find occupation even though they be deprived of employment in their original calling. Another important result

of the use of machinery is falling prices. For example, the average price of pig-iron was $26.13 per ton in 1880, $16.46 in 1890 and $14.29 in 1900. In the case of the last mentioned year, however, there was a tendency to higher prices as a result of the exceptional demand created by unusual industrial activity. Taking the average for the years immediately preceding 1900 we find a much lower rate than that quoted above. Due allowance being made for temporary fluctuations, it is unquestionable that the constant tendency is in the direction of lower prices.

The most striking change in the manufacture of pig iron in the United States during the past quarter of a century has been the steady increase in the capacity of the blast furnaces. The 399 furnaces reported in 1900 had an average capacity of 148 tons per day, while in 1890 the average daily capacity was only 68 tons and in 1880 but 25 tons. In the principal producing states, in Pennsylvania, in Ohio, and especially in Illinois — where the industry is younger than in the other two states, and where there are consequently fewer old plants of small capacity — the average mounts to 244, 220 and 259 tons respectively. The immense furnaces of from 90 to 100 feet in height which are nowadays being built have a still higher capacity. One of the Carnegie Company's furnaces averaged 630 tons per day for the month of December, 1901. In March, 1902, a National Steel Company furnace had an output averaging 636 tons per day for the entire month. The maximum of daily production is reached, so far as I am aware, with 901 tons, a record established in June, 1902, by one of the Carnegie Company's plants. Such enormous daily outputs, due not merely to dimensional increases but to improvements in the apparatus for fluxing, are unheard of in Europe. In the United States, I may add, the older furnaces, which are of comparatively small capacity, are

not lighted save during periods of exceptionally heavy business and high prices — such as that which developed in 1902 and the early months of 1903. Let the demand slacken and prices fall ever so little, and they are at once extinguished because they cannot be operated with sufficient economy to compete with the more modern plants. This is the reason why the oldest furnaces are always the first to become idle, and even to be demolished, during the periods of industrial depression which in the United States succeed one another at almost regular intervals.

In addition to enlarging their furnaces the pig iron manufacturers have also changed their fuels. In 1880, out of a total production of 3,376,000 tons only 1,355,000 tons came from furnaces using a mixture of coke and bituminous coal. Of the remainder, 638,000 tons were produced by the aid of a mixture of coke and anthracite, 994,000 tons by anthracite alone, and 389,000 tons by charcoal. Today the mixture of coke and bituminous is by far the fuel most generally employed. In 1900 no less than 12,254,000 tons were thus manufactured, as against 1,796,000 tons by coke and anthracite mixed, 46,000 tons by anthracite alone, 303,000 tons by charcoal, and 53,000 tons by coke and charcoal mixed. The two last processes are today used only in the manufacture of special castings, and anthracite is being more and more exclusively used for domestic rather than manufacturing purposes, being admirably adapted for household use by reason of its smokelessness.

There are three great centres of pig iron production in the United States. Pennsylvania and Ohio constitute a single field in which coal is very abundant and to which iron ores may be brought at very little expense from the Lake Superior mines via the Great Lakes. In 1900 the former of these states produced 6,778,000 tons of pig iron, the latter 2,560,000 tons. Following these

comes Illinois, which forms a field by itself and also receives its ores from the Lake Superior mines and by water. Its output in 1900 was 1,469,000 tons. Next comes Alabama (1,203,000 tons) to which should be added Tennessee (374,000 tons). Both of these Southern states have a supply of ore and fuel within their borders. Other but secondary centres of production are Virginia (428,000 tons), New York (334,000 tons), Maryland (241,000 tons), Wisconsin (217,000 tons), West Virginia (188,000 tons), New Jersey (150,000 tons) and Michigan (141,000 tons). With the exception of Illinois, Michigan and Wisconsin all the above mentioned states are traversed by the Alleghanies. In the eastern, and still more in the western valleys of these mountains, the blast furnaces dot the country in echelons as it were. No trans-Mississippi state produces any appreciable quantity of pig iron.

Prices vary greatly according to geographical division. They are lower in the Western ($10.23 per ton in Illinois) and in the Southern ($11.21 per ton in Alabama) than in the great Eastern division ($14.98 per ton in Pennsylvania and $15.75 in Ohio). The low price average of Illinois is due to the fact that this state does not produce the fine and special castings manufactured in the Eastern states. In the South, production is cheap because although the furnaces of the region are as a rule less well equipped than the Northern furnaces the cost of labor is very low. The Southern producing states are by far the heaviest exporters. In 1900 no fewer than 113,000 of the 166,000 tons of pig iron shipped abroad, came from Alabama alone. The value of the shipments, however, is stated to have been only $9.64 per ton.

Today the United States is not only the largest producer of pig iron; it is also the country converting the greatest amount of pig iron into steel. This is decisive

testimony to the progress made by the metal manufacturers of that country. In the American republic there is a livelier demand for metal articles than exists in the generalty of European countries, and in the manufacture of almost all of these articles steel gives better results than iron. Twenty-five years ago the steel output of the United States was only 1,027,000 tons, or about 30 per cent of the country's pig iron output, the greater part of which was converted into iron. In 1890 the steel production amounted to 4,775,000 tons, or 47 per cent of the pig iron output. In 1900, it rose to 10,685,000 tons and, in 1902, to 15,186,000 tons, or respectively 74 and 85 per cent of the amount of pig iron produced in these years. With the exception of Germany, which in 1901 manufactured 6,394,000 tons of steel, or 82 per cent of its pig iron production, all European countries are far behind the United States in this respect. In 1901 Great Britain manufactured 5,080,000 tons of steel, converting only 65 per cent of its pig iron production into steel, and France 1,465,000 tons, or but 61 per cent of the supply of pig iron. In both of these last named countries iron is still used for certain purposes for which steel has completely taken its place in Germany and the United States. In 1900 Great Britain and France converted 3,500,000 tons of pig iron into foundry iron, and used 250,000 tons in the manufacture of certain special alloys — ferro-silicon, ferro-manganese, etc.— the demand for which is constantly growing.

It is impossible to undertake here a detailed account of the progress effected in recent years by the steel manufacturers of the United States. As is well known one of two processes is usually employed today in the production of this metal. The first is known as the Bessemer, the other as the open hearth process. In the former the pig iron is run in a molten state into a large receptacle called a converter, and air is then blown through the

metal at high pressure, its oxidizing influence eliminating the carbon from the iron. This process is employed only with pig iron which does not contain more than a thousandth part of phosphorus. In the second process the pig iron is mixed with steel or iron scrap in a furnace lined with bricks, and to the molten mass is added, at a very high temperature, a little ferro-manganese, in such proportions that the desired per centage of carbon will be secured in the resultant steel. There are two varieties of this process, the acid and the basic. The acid is employed only with pig iron containing insignificant quantities of phosphorus. The basic, which is of far more recent invention and has been used in the United States only since 1884, permits the conversion into steel of pig iron having as high as 10 per cent phosphorus. This is a distinct gain, for until the basic process was invented the presence of any noticeable quantity of phosphorus prevented the utilization of pig iron for other than certain castings and greatly diminished its value. In 1880, before the basic process came into use, more than five-sixths of the steel produced in the United States (880,000 tons) was made by the Bessemer process. In 1890, with 3,617,000 tons of Bessemer steel, the proportion was unchanged. In 1900, however, the production was divided as follows: Bessemer steel, 7,523,000 tons; acid open hearth steel, 890,000 tons; basic open hearth steel, 2,154,000 tons; crucible steel, 104,000 tons. Thus the new basic process has been no mean factor in the evolution of steel manufacture in the United States.

One of the most distinctive characteristics of the steel as well as of the pig iron industry, is the great capacity of the plants and the excellence of their equipment. This is largely a phenomenon of the past twenty-five years, and accounts for the fact that the United States leads all other countries both in volume and rapidity of produc-

tion. In 1880 the usual capacity of a Bessemer converter was 5 tons, and in 1890 from 10 to 12 tons. Since then many converters of 15 tons capacity have been built, and one company boasts converters of 20 tons capacity. Open hearth furnaces have similarly expanded. From 7 to 10 tons in 1880, their capacity rose to 20 and 30 tons in 1890 and to 50 tons in 1900. One open hearth furnace is reported to have a capacity of 75 tons. In consequence of these dimensional changes both converters and furnaces are, as may be imagined, comparatively few in number, the figures for 1900 being: 91 Bessemer converters (70 in operation); 152 acid open hearth furnaces (139 in operation); 179 basic open hearth furnaces (168 in operation).

Steel production in the United States, is, further, quite limited geographically. Of the 10,685,000 tons of steel manufactured in 1900, 6,431,000 came from Pennsylvania, 1,813,000 from Ohio and 1,461,000 from Illinois. This means that three states produced more than nine-tenths of the total output. Alabama sends its pig iron north, exports it, or converts it into foundry iron, but manufactures hardly any steel. Of the 890,000 tons produced by the acid open hearth process, 691,000 were manufactured in Pennsylvania. This state also manufactured 1,746,000 and Illinois 236,000 of the 2,154,000 tons produced by the basic open hearth process. Everywhere else the Bessemer converter enjoys an absolute supremacy.

It is out of the question to attempt to survey in detail the statistics relative to the establishments manufacturing finished iron and steel products — rails, bars, structural shapes, rods, plates, sheets, hoops, etc. Since almost all of the immense output is consumed at home, it will readily be understood why the different branches of the industry have, with few exceptions, made greater progress in the United States than in other countries. Of

the really important, only one has, until within recent years, developed slowly. This is the tin-plate and galvanized iron industry, the total output of which was in 1891 only 1,000 tons. In 1900, however, it amounted to 400,000 tons, and today the American production equals, if it does not surpass, that of the British Isles.

In all branches the increase in production has been accompanied by a fall in prices, and this although wages have risen. In 1880, for example, steel rails cost $56.54 per ton, and iron rails, which were still extensively used, $50.32. In 1890, when iron rails had virtually fallen into disuse, steel rails cost only $32.51 per ton. Ten years later their price fell still further, the quotations for 1900 averaging $20.66. Similarly, the price of steel bars and rods fell from $64.86 in 1880 to $43.61 in 1890 and to $40.35 in 1900. And likewise with all steel articles. To be sure, the decline is observable only when we review fairly long periods and compare the prices quoted in successive periods of prosperity and depression. Every industry has good times and hard times. During the latter prices fall, during the former they rise. Naturally, if prices current in a period of prosperity are compared with those obtaining during the immediately preceding period of depression, a rise is found. But if they are compared, as they should be, not with the quotations of the previous period of depression but with those of the previous period of prosperity it will generally be seen that they are below the prices then demanded. The decrease is especially pronounced if the comparison is made between periods of average activity. If prices for the majority of articles declined less rapidly during the decade of 1890–1900 than during the decade 1880–1890, the reason is not far to seek. During the closing years of the decade 1890–1900 the "boom" which has so powerfully affected the industrial and commercial life of North America, had al-

ready set in. The resultant high prices continued, indeed, up to the year 1902. But since the summer of 1903 a downward tendency has made itself evident, notably in the metal industries, and now that the period of exceptional activity is at an end the influence of improved methods and processes of production in the direction of reducing prices may be confidently expected to have free play.

CHAPTER VIII

THE VEHICLE INDUSTRY

If there is any one industry in which the Americans excel it is most emphatically that of transportation. Later we shall have occasion to inquire into the commercial side of this phase of their economic life, and more particularly into the operation of the immense network of railways now covering the Union. But for the moment we must confine ourselves to an examination of the industrial side only and study not the operation but the manufacture of the various kinds of vehicles employed by the people of the United States — both vehicles operated mechanically and vehicles operated by muscular force. The former class comprises locomotives, cars, carriages, etc.; the latter, bicycles, tricycles, etc.— concerning which the "Report" with good reason observes: "It is safe to say that few articles ever used by man have created so great a revolution in social conditions as has the bicycle." Viewed as a whole the vehicle industry is of truly colossal proportions. That it should be so is not at all surprising in view of the fact that in addition to a brisk foreign demand domestic consumption is enormous, thanks to the general industrial activity of the country and the vast extent of its territory. In their turn, it is worth adding, the manufacturers of vehicles are necessarily heavy consumers, providing the principal market for the iron and steel industry.

Curiously enough, while the Americans have done more than any other people to perfect the vehicle industry they are the authors of scarcely one of the great inven-

tions which in the course of the past century have revolutionized that industry. Both the locomotive and the rail were invented in England, as was, more recently, the "compound" locomotive, which has been more generally used in Europe than America, just as Europe today is making greater use of the turbine engine, recently transferred from the realm of theory to that of practice and destined, it would seem, to have a brilliant future. The bicycle, in a sense, dates from antiquity, for, as the "Report" recalls, contrivances not unlike it were known in the most ancient times, as is shown by Pompeian frescoes and by Egyptian hieroglyphs. But in its modern form the bicycle is of French origin, being the invention either of Ernest Michaux or of Pierre Lallement, one of whom in 1865 conceived the idea that the pedal principle might be applied to two-wheeled vehicles as well as to the three-wheeled velocipedes then in use. In fact, it is only in shipbuilding that the Americans can lay claim to discoveries of far-reaching importance, an American — Fulton — having been the first to apply steam as a motive power for ships. Strange to say it is precisely the shipbuilding industry which, after a brilliant youth, shows the least progress of all American industries. It must be said, however, that other than purely industrial causes have co-operated to relegate the United States to a secondary place as a shipbuilding country.

Not only the leading inventions but also the principal technical improvements have been effected by other than Americans. How, then, are we to account for the indubitable supremacy which they enjoy in the manufacture of vehicles for land transportation? The explanation may in part be adduced from the opinions they themselves entertain apropos of the causes of their success in the most important branch of this industry — locomotive building.

In 1900, 3,046 locomotives were constructed in the United States, 272 in railway shops and 2,774 in 28 establishments not owned by railroad companies. These 3,046 locomotives included 2,831 steam locomotives, 55 compressed air locomotives, 155 electric locomotives and 5 gas locomotives, and had an aggregate value of $31,500,000. The average value of each steam locomotive was about $11,000, that of each electric and compressed air locomotive only $2,000 and that of each gas locomotive merely $1,000. The last three classes are thus of much less importance than is the first. During the same year 525 locomotives (more than one-sixth of the output), worth in the neighborhood of $6,000,000, were exported from the United States. With each passing year the exportations have steadily increased. In 1890 they amounted to not more than 161 locomotives, worth less than $1,500,000.

"American locomotives," the "Report" declares with justifiable pride, "have found their way into all parts of the world, having proved their superiority over every type of foreign locomotive with which they have been brought in competition. The large export trade is due to several causes. While the efficiency and the excellence of material and workmanship of the American locomotive are important considerations in many cases, questions of price and speedy delivery have been the determining factors. Building, in large numbers, locomotives with perfect interchangeability of parts, and employing labor-saving machinery of the highest efficiency, American manufacturers have been able to construct engines at lower cost and in less time than any other builders in the world; and the placing of many large foreign orders in the United States has been due to these facts alone.

"American locomotives owe much of their excellence and cheapness to the efficient machines, tools and processes used in their manufacture. The boiler is built

in two sections, entirely by power riveting, practically the only rivets set by hand being those in the single ring where the halves are united. Traveling cranes handle the sheets during the process of construction, and also the completed boiler, so that the use of human muscle is practically eliminated. Multiple-spindle drilling machines not only bore many holes simultaneously, but can also drill each hole through four or five sheets at the same operation if desired, thus securing absolute uniformity in duplicate parts, and at the same time effecting great economy in time and labor. . . ."

Taking the remaining parts one by one, the "Report" explains how the same principle of multiple operation by machinery is applied to ensure precision without the aid of hand labor; and the perfect interchangeability of duplicate parts. "The assembling of the finished parts," it then continues, "and the erection of the complete locomotive are characterized by the same time- and labor-saving methods that are applied in the making of the component parts of the engine. Practically everything is finished and fitted, and some of the parts are even painted, before being transferred to the erecting floor, so that putting the parts together is a rapid operation. The greatest saving of both time and labor in the erecting shop is made by the use of overhead traveling cranes powerful enough to pick up the completed engine, making it possible to lift the boiler for the purpose of placing the wheels in position after the frames and cylinders have been attached, or to move the engine during erection as much and as frequently as may be desired.

"To each portion of the work of erecting the engine is allotted a separate gang of men, each having in a large establishment only one operation to perform. . . . This subdivision and specialization of the work greatly expedites the whole operation, reducing the time necessary

for erecting a completed engine to a minimum that is surprising to those not familiar with the methods employed. The time required for the construction of a completed engine, from the raw material, varies greatly, according to the requirements of the purchaser and the conditions governing the supply of materials. While ordinarily it takes several weeks, or even two or three months, to build a locomotive, some remarkable achievements in quick work have been made by American builders, either to meet emergencies or to establish records. Eight days is probably the shortest time in which an engine has been built, starting with the raw material and constructing all the parts; but an engine has been assembled and erected, ready to run, in twenty-four hours."

I have made this lengthy quotation because it affords an excellent idea of the most remarkable characteristics of American industry: the efficient utilization of lifting and carrying, as well as of constructive, equipment, thereby reducing labor to a minimum and almost entirely doing away with muscular power; the constant endeavor to make perfectly interchangeable parts, so that repairs may be executed easily, quickly and cheaply — an endeavor rendered successful only through the use of machinery; large-scale production of articles identically alike; and an extreme division of labor. To these characteristics American industry owes its unquestionable supremacy, and they in their turn have several bases. They rest, for one thing, on the daring, but practical, bent of mind of the manufacturers, who are always on the look out for improvements, but at the same time are careful not to adopt rash innovations; they rest, also, on the enterprise of the capitalists and they rest on the energy and intelligence of the workmen, who are very productive, who appreciate the usefulness of machinery, who hardly ever oppose its installation, who realize that

while, in a given industry, it may reduce the demand for labor it will increase the demand in manufacture as a whole, and who, accustomed by environment to constant changes, face without fear the prospect of being called upon to take up a new vocation. That they are able to learn new trades quickly is itself a result of the employment of machinery which, by making them supervisors rather than producers of power, stimulates their mental processes. Finally, one of the most distinctive characteristics of American industry — large-scale production — is undeniably facilitated by the enormous area of the country, and by the immense and ever increasing requirements of its great population. It may most certainly be said, therefore, that the industrial supremacy of the United States is due, on the one hand to the qualities of its people, on the other to their natural surroundings. The majority of European countries are quite differently conditioned by nature; but their inhabitants might profitably study and endeavor to reproduce the traits and methods of the inhabitants of the great oversea republic. Indeed, they must do so if they would successfully defend themselves against the latter in the struggle which has already begun and which will become more severe as time passes.[1]

Were we to examine the statistics relative to locomotive building we should find clear indications of the effects of large-scale production and the use of labor-saving machinery. Space forbidding a complete survey let us inquire into the operations of only those establishments, other than railway shops, given over solely or mainly to the construction of locomotives. And in selecting these

[1] It is only fair to point out that if the Americans are unrivalled in the construction of locomotives of the usual type, others can successfully compete with them in building engines of certain special types. Not very long ago I read in the London "Statist" that high-speed locomotives constructed for our Northern Railroad Company by the Alsatian Society of Belfort were being tried not only on English but on American lines. This is certainly a striking tribute to the ability of our manufacturers. (See "The Statist" for Sept. 12, 1903, p. 473.)

we select not merely the class with the largest output but also the only class for which it is possible to obtain approximately exact figures concerning the amount of capital invested, the number of persons employed, and the cost of the materials used. In 1900 there were in this class 28 establishments, as against 19 in 1890 — an increase of one-half. The increase in capital invested was two-thirds, passing from $24,500,000 in 1890, to $40,800,000 in 1900. The increase in cost of materials used was one-half, passing from $13,338,000 to $20,174,000. The value of the output, however, rose only from $24,922,000 in 1890 to $35,209,000 in 1900, an increase of little more than two-fifths. This indicates a decreasing productivity of capital, a phenomenon frequently observed in the case of industries that are no longer young. The increase in the number of persons employed was still smaller. In 1890 the total stood at 15,678; in 1900, at 19,039, a gain of about one-fifth (21 per cent to be exact). Thus there were many less workmen for each establishment in 1900 than in 1890, although the capital of each was greater in 1900 than in 1890. It follows that fewer workmen were required to handle a given quantity of materials and to obtain a given quantity of products. The difference between the increase in the number of employees and the increase in the amount of capital invested also bears striking testimony to the fact that the use of machinery is constantly extending.

Their total output being 2,774 locomotives, each of the 28 establishments averaged about 100 locomotives during the year 1900. Curiously enough, the average was higher in 1890, when the 19 establishments constructed 2,409 locomotives. But the locomotives of 1900 were worth more than those of 1890 (the average value being $11,000 as against $8,000), more material was employed in their construction, they were heavier and they were far more powerful. In one of the principal establish-

ments, the "Report" informs us, the average weight of the engines built in 1890 was 92,000 pounds, exclusive of the tender. On the same basis the average weight in 1900 was 129,000 pounds. Many locomotives exceeding 100 tons in weight have been constructed during recent years. Up to 1900 the largest engine made in the United States weighed about 133 tons, or nearly 190 tons with its tender.

The increase in the weight of the locomotives has been necessitated by an increase in the capacity of the railway cars. It is well known that American cars differ radically from those usually employed in Europe. Thanks to the adoption of bogie-trucks — those little four or six-wheeled sleepers on which each end of the car rests without other than a pivot connection — the Americans have been able to build cars which are much longer than ours, yet take curves easier. It is only of recent years that bogie-trucked cars have been built in Europe, and there are still very few of them owing to the difficulty of handling them on the turntables in vogue on this side of the Atlantic. In the United States, on the contrary, the bogie system has been universally adopted, both for freight and for passenger cars. In 1890 the usual capacity of the American freight cars was from 25 to 30 tons, while the capacity of ours was only from 6 to 8 tons. Today cars having a capacity of from 40 to 50 tons are the rule in the United States; in Europe cars of 10 tons capacity are considered large. It is unnecessary to point out how the American system diminishes both the length and the dead weight of the trains. Nor is progress in construction confined to increasing the carrying capacity. "There is," as the "Report" observes, "a general tendency towards specialization. No longer are grain, beef, fruits and oil shipped in the same kind of cars. The transportation of various kinds of products has called into being cars peculiarly adapted to each class of freight,

so that all sorts of cars are now constructed to meet the demands of shippers."

The year 1900 was a year of extraordinary activity in railway car building, there being constructed no fewer than 144,305 cars, of which 1,371 were for passenger traffic and 143,144 for freight. Of the total number only 26,933 were built in shops belonging to railroad companies. At the beginning of 1901 there were, according to the "Statistical Abstract," 1,409,372 freight cars in the United States. Since not more than 4,000 or 5,000 cars were exported in 1900, it is evident that about one-tenth of the cars in use in the United States in 1901 were made during the preceding year. This would indicate that the rolling stock is kept in first class condition, further proof of which is found in the fact that more than one-half of the new cars were built simply to replace old ones — as is statistically shown by the aggregate increase, the total number of cars in use in 1901 being only 59,000 more than the total number in use during the preceding year.

The methods adopted in the construction of locomotives are likewise advantageously employed in this branch of the vehicle industry — the extreme use of machinery, the manufacture of perfectly interchangeable parts, and concentration of production. The last is especially in evidence. The number of establishments was 65 in 1900, as against 71 in 1890 and 130 in 1880; the amount of capital invested was $88,000,000, as against $43,500,000 in 1890 and $9,000,000 in 1880; the number of persons employed was 33,453, as against 31,354 in 1890 and 14,232 in 1880; the cost of materials used was $61,000,000, as against $44,000,000 in 1890 and $19,000,000 in 1880; and the value of the output $90,500,000, as against $70,000,000 in 1890 and $28,000,000 in 1880. Secondary products, to be sure, accounted for $20,000,000 of the $90,000,000. But, including the output of the railway

shops, the total value of the cars constructed in the United States during 1900 was $86,000,000, of which $77,240,000 represented the value of the freight cars made during that time. This gives an average value of $560 for freight cars, and of about $6,000 for passenger cars.

Leading the world in railway construction, the Americans likewise hold first place in respect to the youthful cycle industry. During 1900 they made no fewer than 1,209,000 cycles, including 1,179,400 individual bicycles, 3,600 tandems and 26,000 tricycles. These were constructed in 312 establishments, having a capital of almost $30,000,000, giving employment to 17,525 persons, paying more than $8,000,000 in wages, and obtaining a product value of about $32,000,000. In 1890 the number of establishments and the product value were twelve times less, the amount of capital invested was fifteen times less, and the number of wage-earners ten times less. Here again we find the usual characteristics of American industry. "In the beginning," says the "Report," "the larger establishments made nearly all the different parts of bicycles they required, but of late factories have more and more specialized their output, and now even some of the largest bicycle manufacturers merely buy the majority of the different parts and assemble them. The American Bicycle Company, controlling a large proportion of the output, is an example. Certain parts of its machines are manufactured in those of its factories best adapted for the purpose, and sent to other plants to be assembled. This procedure greatly lessens the cost of manufacture." The average cost of bicycles has fallen to $18.91 and as a result they are much more generally used than heretofore. American makers ship a number to foreign parts, but not so many as they once did. In 1897 they exported more than $7,000,000 worth; in 1890, scarcely $3,500,000 worth. The decrease is due to two causes. Early enthusiasm having

died out, the demand, while still active, increases much more slowly than it did during the years of the "bicycle craze"; and the industry has taken root in certain countries which at one time were entirely dependent upon the United States for their supply of bicycles.

It is well known that the United States has become the most formidable rival of France in the automobile industry. But according to the "Report" American manufacturers during 1900 built only 4,192 automobiles, aggregating $5,000,000 in value. These motor vehicles were divided as follows: steam carriages, 1,681; electric carriages, 1,575; carriages using hydrocarbon motors, 936. The small representation of the last class — which is the best for long distance travel, just as electrically propelled automobiles are best for urban and suburban use — is perhaps due to the scarcity of good roads. However, 1900 is already a remote date in connection with the automobile industry. And, as the "Report" says, while little attention was paid in the United States to the problems involved in automobile construction until the motor car's possibilities had been demonstrated by French manufacturers, "the awakening of interest in self-propelled vehicles in this country has been followed by the same progress that has characterized the development of many other American industries." Here, again, one of the leading features of the industrial growth of the United States is unmistakably revealed. Great inventions are not made more frequently there than in other countries. Indeed, I am inclined to believe — and I say this free from racial prejudice — that the Americans are less inventive than the French. But if few industries are born in the United States the energy and enterprise of its people, kept ever on the alert by the most strenuous competition; their ceaseless search for improvements, for time and labor-saving devices; their extreme use of machinery; and the extent to which they can press produc-

tion, thanks to their vast and ever widening market, have combined to develop many imported industries far more impressively in America than in the country of their origin.

CHAPTER IX

THE ELECTRICAL INDUSTRY

"Each of the 75,000,000 inhabitants of the United States," says the "Report," "spends an average of $7 per year on electricity. Of this amount about $1.25 per head would represent the demand for electrical apparatus and supplies; the income of the electric traction companies would reach not less than $3 per head; while that from electric lighting would reach about $1.50. The returns available would also indicate that not less than 75 cents per head would represent the expenditure on telephone service, and 50 cents per head the outlay for telegraph, fire alarms and kindred work. These values, which are conservatively put, are, however, rapidly increasing. At least one explanation of the rapid rise of the United States to its present position in international affairs and among the manufacturing nations may be found in this manifest willingness of its people to pay as much for electricity as for bread." This passage has a two-fold significance. On the one hand, it throws a flood of light on the point of view of its author and his fellow countrymen; on the other, it bears striking testimony to the prodigious development of the electrical industry.

In the United States, as in all other countries, this is still an infant industry, and it is only within the past twenty, indeed only within the past ten, years that it has assumed any importance. To be sure, so long ago as 1880 there were in the United States 76 establishments manufacturing electrical apparatus and supplies; but

these represented an investment of only $1,500,000, gave employment to but 1,271 wage-earners, and turned out little more than $2,500,000 worth of goods. By 1890, however, the number of establishments had risen to 189, the capital invested to nearly $19,000,000, the number of employees to 8,802 and the product value to more than $19,000,000. During the next decade the industry developed even more rapidly, the figures for 1900 being: number of establishments, 580; capital, $83,000,000; number of employees, 40,890; product value, $91,000,000. To the last item, moreover, must be added the value of the output of a number of establishments not concerned solely or mainly with the manufacture of electrical goods, but having some products of an electrical nature. A total product value of about $105,000,000 is thus obtained.

Even the above figures afford an extremely imperfect idea of the industrial expansion brought about by the increasing application of electricity to different uses. They do not, for example, take into account the manufacture of a great amount of supplies and apparatus which are utilized by the electrical industry and which would not be manufactured — or, at any rate, would be manufactured in much smaller quantities — did not that industry exist. They also fail to include many articles the output of which would have been much smaller had it not been for electricity, which alone secures a good market for them. Thus, they comprise no statistics relative to the manufacture of the innumerable wooden, iron and steel poles used to support telegraph, telephone and trolley wires. Neither do they cover the greater part of the glass and porcelain used for electrical purposes — for battery jars, insulators, etc., nor the production of bare iron and copper wire, several million pounds of which are annually used for electrical purposes.

Moreover, the greater part of the copper output of the

United States — 180,000 out of 275,000 tons in 1900 — is today refined electrolytically. But this is ignored in the statistics of the electrical industry, as are other branches of electro-metallurgy and electro-chemistry. The extent of the omission may be imagined when it is stated that in establishments at Niagara Falls alone about 35,000 horsepower is used electrically for reducing metals or chemicals. Among other things these establishments make aluminum, of which not less than 3,000 tons [1] were manufactured by electric process in the United States during the latest census year. Another article thus manufactured is calcium carbide, from which acetylene gas is obtained, the output of the Niagara Falls plants in 1900 being at the rate of 12,000 tons per year. Carborundum, a mixture of silicon and carbon and rivalling the diamond in cutting power, is also produced electrically, the American output in 1900 being nearly 4,000,000 pounds.

It must further be understood that the statistics of the electrical industry proper do not include either the immense sums invested nor the large number of persons employed in the operation of telegraph, telephone and electric traction systems. These statistics, to put it briefly, refer only to the manufacture of electrical apparatus and supplies — dynamos, transformers, switchboards, motors for stationary work, motors for locomotion, fan motors, elevators, storage and primary batteries, arc and incandescent lamps and their fixtures, searchlights, telephone and telegraph equipment, phonographs, insulated iron and copper wires, electric conduits, heating apparatus, annunciators, clocks and measuring

[1] The "Report" mentions the interesting fact that "an aluminum wire, replacing one of copper of the same current-carrying capacity, is one-fourth larger in diameter but will weigh only one-half as much, and at recent prices has cost 10 per cent less than the copper." This was written at a time when copper was very dear. To-day copper is the cheaper of the two. It is clear, however, that copper cannot rise above a certain price without being supplanted by aluminum. And since there is a constant tendency in the direction of lower prices, this level must also tend to fall correspondingly.

instruments. When it is stated that in 1900 over $100,000,000 worth of these various articles were manufactured in the United States, it need hardly be said that the industry has expanded more impressively in that country than in any European country, not excluding Germany.

The most important branch, of course, is the manufacture of dynamos, for it is the dynamo which generates the electric current from the energy supplied by steam-power, waterpower, etc. During the latest census year there came from American factories 10,527 dynamos, having a total horsepower of more than 770,000 units and worth upwards of $10,500,000. Although statistics are unavailable for comparative purposes, it is not impossible to form some idea of the progress achieved since the preceding census was taken. In 1890 there were in use in New York state for the generation of electricity for lighting purposes — that being then the principal application of electricity — only 2,344 dynamos of an average horsepower of 30 units. In 1900 there were manufactured in the same state, 1,200 dynamos having an average horsepower of more than 200 units. Young though the industry may be it has certainly grown.

And it has undergone some marked changes. For instance, the old direct-current dynamo, extremely suitable for the generation of electricity for lighting, but limited in power and consequently in carrying ability, has steadily given way to the alternating-current dynamo. The latter, with the aid of transformers which raise or lower the voltage, is admirably adapted for transmitting the current a long distance, and can also be employed for lighting, either with or without the assistance of a direct-current dynamo. All of the powerful generators of today are of the alternating-current type, direct-current dynamos being used only in small plants. To be sure, more direct than alternating-current dynamos are

manufactured annually, the output of 1900 including 9,182 direct-current and only 1,245 alternating-current dynamos. But the former with a total of 428,000 horsepower averaged only 47 horsepower, whereas the latter with a total of 342,000 horsepower averaged 254 horsepower. Thanks to technical progress and to the employment of polyphase currents, there is a constant increase in the power of the average alternating-current machine.

The huge dynamos at Niagara Falls are of no less than 5,000 horsepower and develop current at 2,200 volts, which is raised to 11,000 or 22,000 volts for transmission to Buffalo where it is lowered again for industrial purposes. Large though these dynamos be they will be outclassed by new machines of 10,000 horsepower which it is planned to instal at the Falls, and which will be a distinct improvement over the 5,000 horsepower generators in that the current will be directly developed at a potential of 12,000 volts, thus doing away with the raising transformers and consequently effecting no small saving. Further, these enormous machines have been contracted for at a price equivalent to only $7 per unit of horsepower, or far below the average price, which is at the rate of $14 per unit.

The adoption of alternating-current dynamos of great power has had far-reaching results not only from the technical but from the financial, one might almost say from the social, standpoint. When electricity was first used industrially, the companies generating it usually employed it for one distinct purpose. For example, in 1880 a number of companies were formed to exploit arc lighting and nothing else. Soon thereafter other companies were organized to supply not arc but incandescent lighting. Sharp competition followed until it was discovered that by consolidation both classes of companies would be mutually benefited — would effect a great saving in the cost of production, and would also be in a

position to keep up the price of both arc and incandescent lighting, the current for which could be generated by one and the same dynamo. Consequently a strong fusion tendency at once made itself manifest.

About the same time (1890) the electric railway and the stationary electric motor came into prominence. But while the latter could easily be supplied with power from the circuits used for lighting, the railway motor required — and still requires — a much higher pressure, a pressure of not less than 550 volts. As a result, both traction and lighting companies were operated without recourse to consolidation, the existence of a large number of independent concerns being further promoted by the difficulty of transmitting electric current any great distance. This situation has been completely changed by the alternating-current dynamo. Thanks to it, current may be generated in a central station located at a convenient point in each community, and from this central station transmitted at a high pressure to district sub-stations where the pressure is lowered to the desired voltage, where the current becomes direct, and where it is reservoired in storage batteries. With the aid of transformers a single central station can transmit current for both lighting and traction purposes, over any distance and at much less cost than would be possible were it necessary to generate the current in distinct establishments. Quite naturally, there soon appeared a tendency to concentration, and already the various electric companies of many of the large cities and towns of the United States have effected complete fusion.

One of the principal uses of the electric current being to transmit and distribute the motive power produced in great central stations to stationary or traction apparatus, the most important product of the electrical industry, next to the dynamos which for purposes of transmission convert the motive power into electricity, is the

motors which for purposes of utilization re-convert the electricity into motive power. The value of the electric motors manufactured in the United States in 1900 was about $20,000,000. There are several kinds of motors, but the most important are stationary motors, for supplying power to all sorts of machinery in large and small workshops; and traction motors, for electric street cars and railways. In 1900 the American output of the former was 35,000, having a total horsepower of 515,000 units and worth $7,500,000; of the latter, 15,000 with a total horsepower of 666,000 units and worth almost exactly the same amount as the stationary motors. Every year more and more motors are used in America. During the census year 1900, for example, the New York Edison Company reported a total of 50,000 horsepower of motors connected with its circuits, this being a thirty-fold increase in ten years. During the same year there were in the city of Boston alone no fewer than 4,470 motors, of a total horsepower of 16,000 units, connected to central station circuits. Clearly the demand for stationary motors warrants the enormous output stated above.

The demand for traction motors is even more astonishing, as a result of the remarkable extension taken by the electric street railway business during the past few years. In 1900, according to the "Report," there were in the United States 789 street railway companies, of which only 144 were operated electrically, using but 2,895 cars out of a total of 32,505 of all kinds, and possessing but 1,262 miles of track out of 8,123 miles for all the companies. By 1899, however, the number of cable cars in use had diminished to 4,250 and the number of horse cars to 1,489; while the electric cars, on the other hand, had increased to 50,658, operating on 17,969 miles of track. Further, the capital and funded debt of the electric street railway companies of the

country had risen from $363,000,000 in 1890 to rather more than $1,800,000,000 in 1900, on which capitalization the returns would indicate an earning capacity of 4 or 5 per cent. The adoption of electricity would also seem to have permitted more economical operation. According to the annual report of the Metropolitan Street Railway Company of New York for the census year 1900, the cost of operating with the electric motor was only 13.16 cents per car-mile, as against 17.76 cents with the cable and 18.98 cents with the horse. And this despite the fact that this company operates its system throughout by an underground trolley — as do most companies in the business sections of American cities — a fact which might well be borne in mind by those Philistines who would endow central Paris with a network of poles and wires. It may be observed, too, that there is no mention in the American statistics of traction by compressed air, a system which certain other Philistines, still more barbarous, would impose on all Parisian companies under the pretext of thereby ensuring safer transit.

In addition to the two principal classes, a great variety of motors are manufactured for different purposes to which electricity is much more generally applied in the United States than elsewhere. Take, for instance, ventilating fans, which are absolutely indispensable in the burning summers of North America. During the latest census year no fewer than 97,000 motors, having a total horsepower of 13,000 units and worth more than $1,000,000, were manufactured for this purpose alone. Then there are motors for use in connection with elevators, which are likewise indispensable in the immense office buildings of American cities. "The amount of work that can be done by a modern electric elevator," says the "Report," "is exhibited by those installed during 1898–99 in the Park Row building, New York, the tall-

est office building in the world — a vertical city with an average population of 4,000 people in daylight hours, exclusive of visitors. The contract for this edifice included 15 elevators. Five of these, passenger elevators, rise to the twenty-fifth floor, a vertical lift of 308 feet. Another, intended for safes, heavy weights, etc., runs from the sub-basement to the twenty-fifth floor, a lift of nearly 424 feet." These enormous cages, into which ten or more people may be crowded, ascend and descend without intermission and with a rapidity unheard of in the case of European elevators. On the other hand, since Americans live as a rule in private houses of but two or three stories, not in large apartment houses, they have small need for elevators in their residences. This explains why there are in all New York only 3,300 electric elevators. The value of the motors constructed for this service amounted, in 1900, to $2,500,000.

Omitting mention of other and less important motors, attention is next claimed by storage batteries of which $2,500,000 worth were manufactured in the United States in 1900. But it must be said that this industry of French origin — the "Report" does not fail to pay tribute to the discoveries of Planté and the improvements of Faure — has not developed as was expected, and this despite the recent inventions by Edison. As is obvious, storage batteries are extremely useful in the case of an irregular demand for current, since it can be stored up in them for use as desired and there is consequently no danger of the machinery lacking motive power. But their weight and their fragility militate against their use for traction purposes. "As to storage battery street cars," comments the "Report," "upon the development of which, during the past decade, manufacturers built high hopes, very few remained in operation at the close of the decade. . . . At one time the objections entertained in many cities to the overhead

trolley favored the belief that storage battery street cars were destined to enjoy general adoption in spite of the costliness of their operation and maintenance; but the success of the underground trolley . . . came in time to prevent this development." In addition to storage batteries there were manufactured in the United States during the latest census year $1,200,000 worth of primary batteries, intended chiefly for telegraph and telephone offices.

The electric lighting industry is more prosperous in the United States than anywhere else. In 1900 American manufacturers made 158,000 arc lamps, worth more than $1,800,000, and 25,000,000 incandescent lamps, worth $4,000,000. They also made $225,000 worth of search-lights and projectors and $2,600,000 worth of electric light fixtures.

The telegraph apparatus manufactured in 1900 was worth $1,600,000; but the telephone apparatus manufactured during the same year ran to a far higher value, aggregating $10,500,000. In this there is nothing surprising in view of the fact that the American Bell Telephone Company, the leading company in the United States, controls 1,500 exchanges, uses 1,250,000 miles of wire, employs 33,000 persons, has 1,080,000 subscribers and handles 2,000,000,000 conversations every year. Other companies, controlling less important exchanges, have some 700,000 subscribers. There is thus a telephone for every 40 persons in the United States, and in some places — San Francisco, for instance — one for every 12 persons. Compare this with the conditions obtaining in France.[1] It is true that in the United States the telephone — like the telegraph — is a private institution and does not consider the public as

[1] In 1903 the length of the wires of the American Bell Telephone Company was 2,400,000 miles, and the number of conversations handled was 3,002,000,000, as against 766,000,000 in Germany, 723,000,000 in Great Britain and 187,000,000 in France.

taxable at will. Nor does it reject subscribers on sundry administrative pretexts.

It would be wearisome to discuss in detail all the varieties of electrical apparatus and supplies made by American manufacturers. In closing, however, I would mention that in 1900 they made $6,000,000 worth of heating and cooking appliances (which would indicate that this service of electricity, impossible though it is with us on account of the cost of the current, has in the United States passed from the domain of theory, and that the current is obtainable at a low rate there) and also made $21,000,000 worth of insulated wire and cable. The manufacture of submarine cables is about the only branch of the electrical industry in which the Americans are not bestirring themselves. In almost all others they lead the world. Their practical genius for invention and utilization is nowhere shown to better advantage, and in no other country is there such widespread appreciation of electricity which, as the "Report" remarks, does so much to make life easy.

CHAPTER X

THE TEXTILE INDUSTRY

The manufacture of textiles, at once one of the oldest and most essential of industries, takes high rank in the economic life of every country having any industrial development. Accordingly it is not surprising to find that it has long been of great importance in the United States, which contains an abundant supply of the necessary raw materials and of the means for converting these into finished goods. From its soil is derived four-fifths of the world's supply of the most valuable textile staple — cotton; its flocks of sheep are outnumbered only by those of Australia and of the Argentine Republic; its abundant waterfalls and vast beds of coal provide motive power at a very low cost; finally, its numerous, well-to-do and rapidly increasing population affords a most extensive market for the greatest variety of articles. As a result the yearly gross value of the products of the textile industry and its accessory, the clothing industry, is not less than $1,600,000,000. The net value, making all necessary allowances for duplications, is more than $1,000,000,000. Even if we take no account of the manufacture of clothing, the textile industry still shows a yearly net product value of almost $750,000,000, a total capital of $1,100,000,000, and a total of nearly $210,000,000 paid to 661,000 wage-earners.

Imposing as are these statistics, the United States, despite its tremendous natural advantages, does not yet enjoy primacy in this industry. But according to the "Report" it is today second to England only. In 1900

its consumption of cotton was even superior to that of the latter country, the figures being: the United States, 3,855,000 bales (of 500 pounds each); England, 3,334,000 bales; the entire European continent 4,576,000 bales. But the situation is quite different in respect to manufacturing activity. For one thing, American spinners produce a much larger quantity of coarse and medium yarns and a much smaller quantity of fine yarns than England, France or Germany. Moreover they keep less spindles in operation and fewer wage-earners employed. While Great Britain can show (1900) 46,000,000 spindles, and the continent 33,000,000 spindles, the United States has but 19,000,000. But they are better off, and by far, than any of the continental countries considered individually, for Germany has less than 8,000,000 spindles, Russia (including Poland) less than 7,000,000, and France not quite 5,500,000.

In the wool industry, judging by consumption, the United States disputes third place with Germany and Austria. First place is held by England, which annually consumes about 500,000,000 pounds of wool, and second by France, with an annual consumption of rather more than 450,000,000 pounds. The consumption of the United States is about 395,000,000 pounds, that of Austria almost 387,000,000, and that of Germany 383,000,000. In respect to the manufacture of silk goods, the value of the product — which in this case appears to be a better criterion than the total consumption — places the United States in second place, France ranking first with a product value of $122,000,000, as against $92,000,000 for the United States, $73,000,000 for Germany, $38,000,000 for Switzerland, $21,000,000 for Russia, $17,000,000 for Austria, $15,000,000 for England and $13,000,000 for Italy.[1] Viewing the three principal

[1] These estimates are not to be regarded as exact. But they are sufficiently accurate to show the relative ranking of the different countries. The most uncertainty prevails in the case of the wool industry, for which the "Report's"

branches of the industry as a unit, the United States must assuredly concede first place to England, which is far ahead of it in regard to the two largest branches — the manufacture of cotton and the manufacture of wool. It is also inferior to France in regard to the manufacture of wool and the manufacture of silk, but is so far ahead of us in respect to cotton that we must admit it surpasses us in the textile industry as a whole. All other countries are far outdistanced by it. The secondary industries, the manufacture of flax, hemp and jute products, although but poorly developed in America do not affect the rating. It is incontestible that second place in the textile industry must be awarded to the United States.[1] Third place is probably held by Germany and fourth by France.

While it is only natural that the industry should prosper in the United States, there is no need for feeling surprised that it has not as yet reached the proportions

figures are compiled from the 1894 trade circular of Helmuth, Schwartze & Co., of London, whose statistics the census officials regard as the most trustworthy of recent date and have made but slight alterations in them in order to bring them more nearly into accord with present conditions. The silk statistics are taken from the report of the United States Commissioner to the International Universal Exposition at Paris. In the case of cotton the "Report" avails itself of two independent tabulations which coincide to a remarkable degree and which were drawn up respectively by the New York Commercial and Financial Chronicle, an authoritative publication; and by Mr. Fukuhara, an eminent Japanese expert who has been investigating the cotton manufacture in both Europe and America.

[1] It is interesting to compare, according to the statistics contained in the "Report," the average number of wage-earners employed in the textile industry in Great Britain and the United States:

Industry.	Average number of wage-earners. Great Britain.	The United States.
Cotton	526,107	302,861
Wool	256,425	159,108
Silk	35,461	65,416
Hosiery and knit goods	35,464	83,387
Flax, hemp and jute	156,705	20,903
Total	1,010,162	631,675

In the case of the United States it is necessary to increase the total by 29,776 workpeople, classified as "engaged in dyeing and finishing textiles." The workpeople similarly engaged in Great Britain appear to be included in the above statistics.

it shows in Great Britain. So far as concerns its most important branch — the manufacture of cotton — an overwhelming supremacy is assured those manufacturers who employ the best machinery operated by the cleverest workmen; and that is why the textile industry obtains complete development only in countries wherein manufacturing as a whole is at an advanced stage. Now this last prerequisite can be said to have existed in the United States for not more than a quarter of a century, perhaps for not more than fifteen or twenty years. Until then the Union, like every new country, was above all else an agricultural country. Not only so, but until quite recently the cotton region, peopled by "poor whites" and by negroes who had but emerged from slavery, was preeminently an agricultural region. Fifteen years ago, moreover, the general economic conditions confined all manufacturing activity to the north-eastern states, which, far removed from the cotton fields of the South, had no appreciable advantage over England in the purchase of the raw material and were, on the other hand, far less favorably situated in respect to securing machinery, if not in respect to securing motive power and labor. Conditions are completely different today, as a result both of the general expansion of American industry and of the establishment of the cotton manufacture in the states where cotton is grown. As concerns wool, it may be said that altho the United States produces more than does any European country it cannot meet the home demand, and is obliged to import large quantities. So that in this branch it has no special advantage over Europe. It is showing rapid progress, however, in the manufacture of silk goods. Silk, I need hardly remind my readers, is an article of luxury, or at any rate of semi-luxury, for which the United States has been ready only a few years. Twenty years ago, accordingly, it had scarcely any silk mills. Since then, it has been

advancing in this branch of the textile industry with giant strides; progressing, in fact, at a speed sufficient to alarm even France.

Except in the case of a few special commodities, the United States until recently imported many more textiles than it exported. If its output kept increasing wonderfully, so did its population and, consequently, the home demand, and as a result the difference between imports and exports diminished but slowly. The extraordinary period of prosperity which began in 1897 has made a great change in the situation. Exceptionally active as the home demand has been since then, the domestic output has increased even in greater proportion, and accordingly the exports have risen much more than the imports have. It is altogether likely that when the national consumption falls off, or ceases to increase rapidly — which will inevitably happen because such prosperity is not everlasting, and which would seem to be happening already — exports will not merely take an appreciable advance but will even exceed imports in many branches in which the balance of trade is today the other way.

This will undoubtedly be the case with the products of the American textile industry which, while not yet entirely satisfying the home demand, comes far nearer satisfying it than it did thirty years ago. Viewing only its three principal branches — cotton, wool and silk — we find that it produces $743,000,000 worth of goods annually and that the yearly consumption of the United States reaches $800,000,000. The excess of imports over exports is thus $57,000,000, or 7 per cent of the consumption. In 1870 the output was worth $389,000,000, while the consumption amounted to $466,000,000, the excess of imports over exports thus being $77,000,000, or 16.5 per cent of the consumption. Just how rapidly the industry has progressed may readily be seen from the following table:

PRODUCTION, CONSUMPTION, EXPORTS AND IMPORTS OF THE DIFFERENT TEXTILES: YEARS 1870 AND 1900.

(In millions of dollars.)

	Cottons.	Wools.	Silks.	Total.
Production in 1870	177.5	199.3	12.2	389.0
Exportation	3.8	0.12	0.01	3.9
Importation	21.9	35.0	24.2	81.2
Consumption	195.6	234.2	36.4	466.2
Production in 1900	339.2	297.0	107.2	743.4
Exportation	24.0	1.3	0.25	25.6
Importation	39.8	15.6	26.8	82.2
Consumption	355.0	311.3	133.8	800.1

It is apparent that for the industry as a whole both consumption and production have greatly increased, and the latter much more than the former. For cotton manufactures, the increase in production is about 90 per cent, the increase in consumption 80 per cent. For wool manufactures production has increased but 49 per cent and consumption only 33 per cent. For silk manufactures production is nearly nine times more than it was thirty years ago, and consumption three and one-half times more. In respect to foreign trade, the excess of imports over exports has decreased for cotton and wool manufactures, but remains the same for silk manufactures. It is worth observing, in passing, that the reduction has not been brought about by the same causes in respect to cotton and wool. Insignificant in all three branches in 1870, the exports have remained at about the same level for wool and silk goods, but have increased markedly for cotton manufactures. The imports, on the other hand, have increased in silk, by reason of the colossal development of the demand; have decreased in wool, and have increased in cotton, but only in respect to certain products which are a luxury or a semi-luxury — embroideries, laces, etc. If to the three principal branches be added the hosiery and knit goods industry,

it will be found that the American consumption amounts annually to $895,000,000, and is supplied by imports to the amount of only 9.2 per cent. In a word, with the exception of certain special articles the American textile industry is at last in a position to fill home orders and is beginning to supply the foreign trade. The next few years will doubtless see it in lively competition with Europe.

While the several branches have some characteristics in common they betray so many differences that it is impossible to study them as a whole. Let us, therefore, examine them one by one, beginning with the most important, that is to say with the manufacture of cotton. This is the oldest of the great American industries, the first factory in which spinning was carried on by means of machinery having been established so long ago as 1790. It had only 72 spindles, however. During the industrial "boom" that followed the War of 1812 with Great Britain, a fairly large number of cotton mills were put into operation in New England, in the vicinity of Boston and Providence, in a region abounding in waterfalls that provided the necessary motive power. Since then, and even to the present day, the states of Massachusetts, Rhode Island, Connecticut and New Hampshire have been the chief centres of this manufacture which, as the "Report" remarks, is essentially "gregarious" and has tended, ever since its inception, to be carried on in extremely large establishments or in dense groups of fairly large establishments.

The reason for this is that while the raw material may be prepared, spun and woven by hand, so much labor is required that even the poorest communities cannot afford to manufacture the textile in this way once a mechanical process comes into competition. Hence, to quote once more from the "Report," "virtually the whole manufacture is abandoned to the care of capital. More-

over, inasmuch as the improvement of machinery has cheapened the processes to a wonderful degree, it has become more and more difficult for novices to engage in the business with success. The result is that the manufacture tends greatly to concentrate, to expand in communities where already established, and to be neglected or to languish in regions where it is newly introduced, unless favored by special advantages."

The following table will assist in forming an idea of the more recent development of the cotton industry as a whole:

	1880.	1890.	1900.
Number of establishments.....	1,005	905	1,055
Capital (millions of dollars).....	219.5	354	467.2
Number of wage-earners.....	185,472	218,876	302,861
Wages (millions of dollars).....	45.6	66	86.7
Cost of materials used (mils. of dols.)	113.8	154.9	176.6
Value of products (millions of dollars)	211	268	339.2

The growth of the industry may be estimated in two ways: either by ascertaining the consumption of raw cotton, or by ascertaining the number of spindles employed in its manufacture. It is interesting to compare the rapidity with which it has expanded in the United States and other countries, and for this purpose I include the two following tables taken from the "Report" and brought up to the year 1903 by statistics obtained from the New York Commercial and Financial Chronicle:

WORLD'S CONSUMPTION OF COTTON SINCE 1830.
(In thousands of bales.)

	Great Britain.	European Continent.	The United States.	Other Countries.
1830.....	711	411	130	....
1840.....	1,156	629	255	....
1850.....	1,458	776	553	....
1860.....	2,265	1,490	813	....
1870.....	2,639	1,842	875	....
1880.....	2,924	2,455	1,543	....
1890.....	4,140	4,277	2,983	....
1900.....	4,167	5,720	4,819	2,442
1903.....	4,000	6,370	5,019	2,550

WORLD'S SUPPLY OF COTTON SPINDLES SINCE 1861.
(In thousands of spindles.)

	1861.	1877.	1887.	1900.	1903.
Great Britain	30,300	39,500	43,000	45,600	47,200
Europe	10,000	19,600	23,750	33,000	34,000
The United States...	5,000	10,000	13,500	19,130	22,240
India	338	1,230	2,400	4,946	5,100
Japan	.....	.....	.....	1,221	1,450
China	.....	.....	.....	600	600
Canada	.....	.....	.....	670	700
Mexico	.....	.....	.....	500	500

These figures show that the industry made very rapid progress in the United States up to 1860, when its growth was retarded by the disastrous War of Secession and its aftermath. Since then it has gained ground with even greater rapidity than before the war, and particularly during the last fifteen years covered by the table, when the increase in spindles, as well as in consumption, was almost as great in the United States alone as on the entire European continent. On the other hand, much slower progress is seen in Great Britain, although that country still leads all others, and easily, in the manufacture of cotton. That progress should now be slow is not at all surprising. It is in no wise a sign of decadence, but is simply due to the fact that in proportion to the passage of time Great Britain necessarily loses the advantages she has enjoyed as a result of having been the first in the field, of having been the first to work coal mines and the first to build improved machinery. Not only this, but she is now handicapped by the fact that her population is increasing less rapidly than the population of certain of her competitors, the United States in especial.

The manufacturers of Great Britain complain of "hard times," but they are not the only ones entitled to raise that cry, and it is certainly unreasonable to believe that the manufacturers of the United States are

shielded from the vicissitudes which assail their competitors in the Old World. "The growth of the industry," says the "Report," "is sufficient proof, were such proof needed, that it has been profitable. Nevertheless it has been subjected to many and sometimes protracted seasons of discouragement and loss. The margin between the price of a pound of raw cotton and that of a pound of goods, whether yarn or cloth, is, in the face of the keen competition which exists, so small that the profits of a mill during a whole year may depend upon the luck or judgment of the treasurer in buying his raw material at the right or the wrong season, which in turn largely depends upon his skill or his fortune in forecasting a large or a small cotton crop. . . . Upon the whole, the history of the past ten years was not one of prevailing prosperity. Two influences interfered to reduce profits — an extremely wide fluctuation in the price of cotton, and the great increase of competition caused by the growth of the industry in the Southern states. The first of these influences was general in its application; the second applied to Northern mills only."

Indeed, the most striking fact in the history of the cotton industry for the past ten years, and the fact of most importance not only to the United States but to the world, is the way in which the industry has taken root and flourished in the Southern states. Until 1880 this great region of production engaged scarcely at all in the manufacture of cotton. Up to 1865, of course, slavery was largely responsible for this inactivity; and for some years thereafter the consequences of the Civil War were similarly inhibitory. Soon after 1870 a few mills were put into operation, but even until 1880 the region did not boast more than 800,000 spindles. So recently as 1887 the South could still show but 1,225,000 of the 13,500,000 spindles then in operation in the United States. But by 1890 it possessed 4,540,000 out of a

total of 19,130,000, and, finally, in 1900, no less than 7,040,000 out of a total of 22,240,000. On the other hand for the past sixteen years (from 1887 to 1903) the manufacture of cotton has developed slowly in the North and the Centre, the number of spindles in these geographical divisions rising only from 12,275,000 to 15,200,000. New England is thus in almost the same predicament as Old England.

It is significant, too, that the industrial prosperity of the South does not result simply from the fact that low wages are paid there. Unquestionably, of course, the rate of wages is low. The 97,539 persons employed in the Southern cotton mills received, in 1900, only $17,509,000 in wages, or scarcely $180 per wage-earner; while the 164,944 mill hands of New England received $56,258,000, or an average of $340. In the Central states, where cotton manufacture is much less developed, the rate of wages paid is about that of New England. To be sure, many more children are employed in the Southern than in the Northern mills — which is usually the case with young industries. In New England 48.2 per cent of the wage-earners are men, 45.1 per cent are women, 6.7 per cent are children. In the South 41.6 per cent are men, 33.4 per cent are women and 25 per cent are children. These, I should add, are the percentages of 1900. Twenty years earlier the ratios were: in New England, 36.2 per cent men, 49.7 per cent women and 14.1 per cent children; in the South (where the industry was then merely in embryo) 28.4 per cent men, 46.5 per cent women, and 25.1 per cent children. Every year sees fewer women employed in the manufactures of the United States; fewer, at any rate, in proportion to the male wage-earners. And in the textile industry the proportion of women employed is falling with surprising rapidity. As the "Report" points out, one reason for this is "that the operation of some of the machines

in use today requires the care of men because it is beyond the physical and nervous capacity of women." This is particularly the case with automatic, high-speed looms, a number of which (eight and sometimes more) are put under the charge of a single man. Happily, it is probable that the number of children employed will also diminish in the South, as it already has in the North. Since the last census was taken a distinct tendency in this direction has been observed.

But, over and above the low rate of wages, there is another cause for the rapid growth of the cotton industry in the South. This is the fact that all the factories in that region are provided with the most modern equipment. Indeed, the first factory operated wholly by electricity, without shafting or belts, was located in the South. Being able — thanks to the coal beds of Alabama and Tennessee and to a number of waterfalls — to secure motive power as cheaply as, if not more cheaply than the mills of the North — to say nothing of their advantages in respect to procuring raw material — there is absolutely no reason why the Southern operators should not do as well as their Northern competitors. Up to the present the Southern output has been chiefly coarse or medium goods, but already the South leads the North in respect to export trade. South Carolina — formerly one of the least active manufacturing states of the Union — alone supplies 45 per cent of the cotton exports of the United States, while the South as a whole supplies fully 66 per cent. This is why the growth of the industry in the South interests not simply America but the entire world. In fact, it is altogether probable that the Southern states will be the most formidable competitors of Europe in the exportation of coarse cottons to new countries.

The wool industry, which from 1860 to 1890 was the principal branch of American textile manufacture — if

not in point of capital invested and persons employed, at any rate in point of product value — has for the past ten years been secondary to cotton, which has thus regained the primacy it enjoyed before the Civil War. The United States is far less favorably situated by nature for the production of wool than it is for that of cotton. For one thing, it is by no means so richly endowed with the raw material. For another, important as is the part played by improved machinery in the cotton industry, machinery has much less to do with the development of the wool business — a significant fact, since it means that in this industry at any rate the country par excellence of machinery is largely deprived of one of its greatest advantages. Finally, the market for wool goods is narrowing in every country, owing to the increasing use of cotton goods, and, naturally, the production is governed by the demand. Despite all this, the wool industry must still be accounted prosperous in the United States, and although 1900 was a poor year, the statistics assembled by the "Report" bear striking testimony to its vitality.

It has already been observed that the United States stands third among the manufacturing nations in point of wool consumption. In 1900, the "Report" estimates, the demand amounted to about 394,000,000 pounds, as against a consumption by Great Britain of 502,000,000 pounds, and a consumption by France of 457,000,000 pounds. In 1890 the American consumption was rather less than 373,000,000 pounds. In the interim of the two censuses there has thus been but a modest increase, amounting to a scant 6 per cent and quite insignificant when compared with the 60 per cent increase in the consumption of cotton during the same period. It is true that the consumption of wool appears to have been much less in 1900 than in the years immediately preceding. This was due to a remarkable rise

in the price of the raw material, in consequence of which many factories were compelled to close down or run on part time, it being impossible to sell the finished goods at a profit. Adding the total amount of the home production for the years 1891–1900 to the total amount of imports for the same period, and then deducting from this grand total the total amount of exports (which were practically negligible) we obtain an annual average of 444,000,000 pounds, which may fairly be accepted as representing the average yearly supply, for there is nothing to warrant the supposition that the stock on hand at the end of 1900 was more considerable than that on hand at the end of 1890.

Of these 444,000,000 pounds, 285,000,000 pounds represent the domestic and 159,000,000 pounds the foreign supply. Making a similar calculation for the decade 1881–1890, it is found that the average annual supply was 370,000,000 pounds, of which 281,000,000 pounds represented the domestic and 89,000,000 pounds the foreign supply. The amount of imports has greatly varied from year to year, largely as a result of tariff changes. From 1890 to 1894, while the McKinley Act was in force, the average annual importation was 116,000,000 pounds. From 1894 to 1897, under the Wilson tariff, which provided that wool should enter duty free, the average rose to 281,000,000 pounds. From 1897 to 1900, as a result of the high impost fixed by the Dingley tariff, it fell to 92,000,000 pounds. In 1900, however, there was a decided upward movement, in consequence of the exhaustion of the supply that had been purchased at the end of 1896 and the beginning of 1897 in advance of the re-imposition of duty.

It is worth noting that of the 128,000,000 pounds imported in 1900, 105,000,000 pounds were used in the manufacture of carpets and rugs and only 23,000,000 pounds in the general wool manufacture. The latter is

supplied almost entirely by native wool, which is usually of a fine quality. This explains why not more than 15 per cent of the wool imported in 1900 came from Australia, a country famed for its fine wools. Almost as large a percentage, but of a medium quality, came from South America. The remainder came from Europe and Asia (25 per cent from Europe, 45 per cent from Asia) and chiefly from China, which is the largest exporter of wool to the United States. Obviously, the domestic production is far from meeting the demand, especially in respect to the coarse "Class III." goods. Nor is it likely that the situation will greatly change in the near future, for the flocks of the United States are increasing very slowly. In many sections grazing is being replaced by husbandry, and the extreme dryness of the climate of the Far West — the live-stock region par excellence — does not permit raising on the intensive principle.

Another fact to be mentioned is that of late years the consumption of wool has increased less rapidly than the population. Making allowance for the raw material included in the imports — and although this can be estimated only approximately, absolute precision is by no means required for, since 1870 at any rate, the imports have always been less than one-half of the home supply — it appears that the per capita consumption was 4.49 pounds in 1840, that it rose rapidly to 7.93 in 1870, continued to rise, but more slowly, to 8.75 in 1890, and then fell to 6.93 in 1900. This has been brought about by two causes — one, the excessive, almost prohibitive duty imposed by the Dingley tariff; the other, the increasing competition of cotton goods.

Moreover, American wool manufacturers themselves make great use of cotton — their consumption being (in 1900) 43,000,000 pounds of raw cotton and 55,000,000 pounds of cotton yarn, for the production of which about 65,000,000 pounds of raw cotton was required,

the approximate consumption of cotton fiber by wool manufacturers thus being 108,000,000 pounds. If we substitute for the figures given above, which apply to wool in the grease, the weight of the wool in the scoured state, we find that the wool industry makes use of but 239,000,000 pounds of wool. Thus its consumption of cotton is not far from one-half its consumption of wool. To be sure, the latter must be increased by 91,000,000 pounds of shoddy the use of which the "Report" finds reason for warmly endorsing. "The use of shoddy," it declares, "has made possible a greater supply of warm clothing than could have been obtained without it, while the mixture of cotton and cotton yarn with wool has made possible the production of soft, light-weight fabrics, well adapted for use where lightness, moderate warmth and low cost are desired, and consequently the people are better clad than before these combinations were devised."

The condition of the wool industry as a whole, but exclusive of the hosiery and knit goods industry, may be seen from the following table, reproduced from the "Report":

	1880.	1890.	1900.
Number of establishments	2,330	1,693	1,414
Capital (millions of dollars)	143.5	245.9	310.2
Number of wage-earners	132,672	154,271	159,108
Wages (millions of dollars)	40.7	54.3	57.9
Cost of materials used (millions of dols.)	149.2	167.2	181.2
Value of products (millions of dollars)	238.1	270.5	297

Here, as in almost all the large industries of the United States, a definite tendency to concentration is evident. In twenty years the number of establishments has decreased by 40 per cent, while the amount of capital invested has almost doubled, the product value has increased by 25 per cent, the number of persons employed by 25 per cent, and the sum paid in wages by more than 40 per cent. The increase in the amount of capital in-

vested is, it should be observed, largely due to the greater outlay necessitated by improvements in equipment.

Without entering into technical details, I must at least call attention to one or two of the distinctive characteristics of the industry as it is carried on in America. In the first place, spinning on the custom system is almost unknown in the United States, whereas it is quite common in Europe. In the second place, as a general thing, but without being as striking a feature of the wool as of the cotton industry, spinning and weaving are performed in one and the same establishment and the quantity of yarn manufactured for sale is relatively small.

For a long time carded wool products only were manufactured in the United States, partly because of the more simple character of the operations involved, and partly because the wool of the Merino sheep raised in the United States was not well adapted to the combing process as carried on by early combing machines. To-day, both sheep and machinery having been improved, this dual handicap has disappeared. Since 1880, if not since 1870, the manufacture of woolen goods (carded wool products) has steadily increased less rapidly, has even shown a decrease, while worsted goods (combed wool products) have been put out in constantly greater quantities. In 1870 there were in the United States only 161 combing machines. In 1880 there were 288, in 1890, 673, and in 1900, 1,194, while the number of cards was for the same dates, 8,705, 6,989, 7,015, and 6,605.[1] The following statistics will assist in forming a clearer idea of the changes wrought in the wool industry during recent years:

Number of establishments:

	1880.	1900.
Woolen goods	1,990	1,035
Worsted goods	76	186

[1] It is true that the capacity of the cards has increased.

	1880.	1900.
Capital (millions of dollars):		
Woolen goods	96.1	124.4
Worsted goods	20.4	132.2
Number of wage-earners:		
Woolen goods	86,504	68,893
Worsted goods	18,803	57,008
Value of products (millions of dollars):		
Woolen goods	100.6	118.4
Worsted goods	33.5	120.3
Number of spindles:		
Woolen goods	1,756,746	1,906,581
Worsted goods	240,118	1,371,026
Number of looms:		
Woolen goods	35,634	34,881
Worsted goods	14,411	26,372

It is to be observed that the worsted goods establishments are, as a rule, much larger than those with carded wool products. Viewing both branches collectively, however, it is apparent that they have not made any impressive progress; for in twenty years the value of the products has advanced only from $194,000,000 to less than $238,000,000. This, for an American industry at any rate, is decidedly slow growth. It is true that the gain in quantity of output is much more than that in value of output; but one of the chief sources of complaint on the part of the woolen manufacturers is the constantly increasing substitution of tricots for woolen and flannel underwear.

Much more prosperous than the wool goods industry proper is the manufacture of carpets and rugs. This industry has advanced in America with giant strides, especially during the period 1860–1890. Since the latter year its progress has been much less rapid, but is still remarkable, the decrease, no doubt, being largely due to the duty on wool. The value of the carpets and rugs manufactured in the United States was $7,800,000 in 1860; $21,700,000 in 1870; $31,800,000 in 1880; $47,770,000 in 1890, and $48,192,000 in 1900. In the last named year the amount of capital invested was

$44,500,000 as against $38,000,000 in 1890; $21,500,000 in 1880; $12,500,000 in 1870, and less than $5,000,000 in 1860.

As is the case with the majority of industries which are no longer young, the number of establishments shows a decrease — from 215, the maximum, in 1870, to 195 in 1880, then to 173 in 1890, and finally to 133 in 1900. On the other hand, the number of persons employed has risen — from 12,000 in 1870 to 20,000 in 1880, to 28,736 in 1890, and to 28,411 (a slight decrease) in 1900. Thus, as we have already found in many other industries, the tendency is to concentration of production. Machinery, likewise, is more and more extensively employed, as is shown by the fact that whereas 8,300 power looms and 2,598 hand looms were used in 1890, only 1,048 hand looms were in use in 1900, while the number of power looms had risen to 9,706. Today the manufacturers of the United States turn out a sufficient quantity of carpets and rugs to meet almost the entire domestic demand, the annual importations (1900) being only 820,000 square yards (worth $2,500,000), of which 640,000 square yards are rugs of high quality, either Aubusson, Axminster or Oriental rugs, all articles of luxury and having a value of $2,300,000.

All the branches of the wool industry are carried on chiefly in the four states of Massachusetts, Rhode Island, Pennsylvania and New York, which together account for $222,000,000 of the $297,000,000 worth of wool products manufactured in the United States. The output of Massachusetts alone is worth $81,000,000; that of Pennsylvania nearly $78,000,000. The manufacturers of Massachusetts and Rhode Island are principally occupied in the production of worsted goods; those of Pennsylvania and New York in making carpets. The city of Philadelphia alone makes $56,500,000 worth of wool products every year; the city of Lawrence, in Massachu-

setts, $25,500,000; and the city of Providence, in Rhode Island, $18,000,000.

Impressive as are these figures, it is safe to say that Europe will find the competition of the wool industry, taken as a whole, much less formidable than that of many other American industries. Not being favored in any special way, and being actually handicapped by the high import duty on the raw material, the manufacturers of the United States can make only slow headway.

The situation is quite different when we turn to the hosiery and knit goods industry, which has made really remarkable progress, largely as the result of the increasing use of tricots for underwear. Today the distinctive characteristic of this industry is that it makes use of much more cotton than wool; twenty years ago, the reverse obtained. The total weight of the cotton and cotton yarn consumed by it in 1900 was five times that of the wool and wool yarn. In 1890 the difference in favor of cotton was much less, for then the industry made use of fully one-half as much wool as cotton. The following table will sufficiently indicate how it has developed within twenty years:

	1880.	1890.	1900.
Number of establishments	359	796	921
Capital (millions of dollars)	15.6	50.6	81.9
Number of wage-earners	28,865	59,588	83,387
Wages (millions of dollars)	6.7	16.6	24.4
Cost of materials used (mils. of dols.)	15.2	35.9	51.1
Value of products (mils. of dols.)	29.2	67.2	95.5

We now come to the silk industry, undoubtedly the most prosperous and boasting the most rapid growth of all the textile manufactures of the United States. In fact, the only country in which it has developed more impressively is France, and at the time of writing it is even doubtful if France still enjoys primacy, for the silk output of the United States is now much larger than it was when statistically surveyed in 1900.

The American demand, as may be imagined, is very heavy. With the possible exception of England more large fortunes have been amassed there than in any other country. More than this, the inhabitants as a whole are comfortably off. They earn a good living and they like to spend money freely and keep up appearances. Naturally, silks contribute not a little to the satisfaction of this desire. So, without making any attempt to build up an export trade — though the time is perhaps not far distant when such an attempt will be made — the silk manufacturers of the country have developed a very large business. The value of the domestic output is two and one-half times as great as it was twenty years ago, and sixteen times as great as it was forty years ago. Imports, on the other hand, are far from having increased in like proportion, as may be seen from the following figures:

	Imports of raw silk (in pounds).	Value of finished goods. (In millions of dollars). Domestic.[1]	Imported.
1850	120,010	1.8	17.7
1860	297,877	6.6	33.0
1870	583,589	12.2	24.2
1880	2,562,236	41.0	31.3
1890	5,943,860	87.3	37.3
1900	11,259,310	107.3	26.8

The maximum annual importation of silk goods was reached in 1882, when the purchases from foreign countries amounted to $38,985,000. In the case of imports of raw silks the record year is 1902, when not less than 13,762,254 pounds of raw silk — or one-half the consumption of France — were brought in from foreign countries, while the purchases of silk goods abroad aggregated $35,500,000 in value in 1903.[2] This is unquestionably attributable to the increased prosperity of

[1] These figures refer to gross value. To obtain net value allowances must be made for duplications. In 1900, the net value was about $92,000,000.

[2] In 1903 the amount of raw silk imported rose to 15,270,000 pounds, and in 1904 to 16,292,000 pounds. H. A. B.

the Americans who, according to the statistics, procure from other peoples a larger quantity of articles of luxury than they produce at home.

"During the last ten years," says the "Report," "every weave, article and quality known to mechanical weaving, or which through alterations on machinery or simplification in manufacturing could be put in reach of power-loom weaving has been manufactured in the United States. With the exception only of a few Lyons specialties, which for different reasons are not suitable for mechanical weaving, every style which the silk industry brings to the market is manufactured in our mills." As may be expected, the distinctive characteristic of the silk industry in the United States is the increasing employment of machinery. In 1880 there were in the American silk mills 5,321 power looms and 3,153 hand looms. Ten years later there were 20,822 power looms and only 1,747 hand looms. Another ten years and the hand loom had practically disappeared, only 173 being employed as against 44,257 power looms.

The ingenuity of the Americans has found a congenial occupation in constantly improving the looms employed in this industry, and in inventing new looms. The "Report" draws attention to the fact that American manufacturers were the first to adapt power looms to the production of taffetas. To them, likewise, must be credited the invention of the high-speed automatic loom for the manufacture of ribbons of various widths. It might also be added that, as the "Report" reminds its readers, American silk manufacturers won several gold and silver medals at the Paris Exposition of 1900, and notably the *grand prix d'honneur,* the highest award given, in the sewing silk section. Except in the manufacture of various articles of luxury, in the production of which our Lyons weavers will for a long time, if not for

ever, lead the world, the silk manufacturers of the United States are assuredly second to none.

Nor does the American silk industry show any signs of having reached its limit of expansion. According to the annual report of the Silk Association of America the equipment added in 1902, or projected for installation during the early part of 1903, included 5,533 looms for dress goods, etc., and 330 ribbon looms. This means an enormous increase in the productive capacity. One may well ask whether it does not eventually mean a crisis for the silk manufacturers of the country, a crisis, moreover, which will have serious consequences to us. For, so soon as their output exceeds the home demand, the American manufacturers, with their domestic market protected by a very high impost, will doubtless seek to dispose of their surplus wares by selling them in foreign markets at low prices. Once such an attempt is made, it will very likely be continued. Accordingly it may fairly be said that not only in respect to everyday articles but even in respect to articles of luxury the competition of America begins to menace Old Europe.

CHAPTER XI

THE FOOD PRODUCTS INDUSTRY

In several new countries — the United States, the Argentine Republic and Australia — the preparation of food-stuffs has developed into a business of an importance unknown in Europe. In the Old World manufacturing activity of this sort is mainly confined to the production of sugar, chocolate and spirituous liquors, to the canning of vegetables and to the salting of certain fish. The meat supply is generally obtained on the hoof, and there is little or no opportunity for the growth of a meat packing industry. Even milling is conducted on a large scale in only a few countries. In the New World, on the other hand, the possibilities for extensive live-stock raising, and the necessity of shipping meat over distances so great that it is inconvenient to transport it on the hoof, have given rise to a colossal packing industry which, owing to the commercial advantages gained by making heavy shipments to distant markets, is usually carried on in large establishments. The milling industry is similarly organized, while factory production of butter and cheese is another striking feature of the economic life of the New World.

The causes operating to develop a food products industry are nowhere so powerful as in the United States. For this reason it is not surprising to find that this industry stands first among the fifteen industrial groups in point of value of output. In 1900, when the textile and the iron and steel industries could show a product value, respectively, of only $1,637,000,000 and $1,793,000,000;

the product value of the food products industry was $2,273,880,000, and this without including the value of the output of the liquors and beverages industry. To be sure, in point of capital invested and persons employed, both the textile and the iron and steel industries rank above the food products industry, which, nevertheless, could in the census year boast $937,000,000 of capital invested and 311,000 persons employed.

As has been pointed out in a preceding chapter there is one great reason for the primacy of the textile and the iron and steel industries in these respects. The raw material employed in the food products industry undergoes comparatively trifling change in process of manufacture, and consequently the machinery used by this industry is less complex and less costly and therefore calls for a smaller investment of capital than in the other two industries. For the same reason the food products industry requires a smaller supply of labor than they do. To adduce statistical proof, the value of the output of the food products industry is barely 25 per cent greater than the cost of the raw materials used — which, in 1900, was $1,837,000,000 — while the product value of both the textile and the iron and steel industries is twice that of the raw materials. This clearly shows that in the process of manufacture the raw materials used by these industries undergo no small change. So that it cannot be said that the food products industry is of such importance in the economic life of the country as a first glance might lead one to suppose. But while it employs less capital and less labor than the textile, the iron and steel, or even the lumber industry, it none the less deserves careful study.

It is especially deserving of study because, for one thing, it accounts for a large proportion of the country's export trade, and, for another, it reveals more clearly than do the majority of industries the most distinctive

characteristics of American manufacture, the factors which have contributed so much to its success. These, I would once more remind the reader, include great concentration of production, division and sub-division of labor, utilization of all by-products, and the use of machinery even for operations in which one would least expect to find machinery employed.

The principal, and also the most interesting branch, is the slaughtering and meat packing industry. In 1900 this had 921 establishments, with $189,000,000 of capital invested, and giving employment to 10,227 salaried officials and clerks and 68,534 wage-earners to whom were paid $10,000,000 in salaries and $33,000,000 in wages; using $683,000,000 worth of raw materials, and producing an output worth $785,000,000. In order to show how this branch has grown of late years, it need only be said that in 1880 the amount of money invested in the slaughtering and packing industry was not more than $49,000,000, that the value of the output was but $303,000,000, and that only 27,000 salaried officials, clerks and wage-earners were employed. Thus, in twenty years the capital almost quadrupled, while the number of employees and the product value showed an increase of more than 250 per cent. Again, while there were more slaughtering and packing establishments in 1900 than in 1880, there were less in 1900 than in 1890, the figures being 921 in 1900 as against 1,118 in 1890 and 872 in 1880. Once more we find a distinct tendency to concentration, and we also find — as shown by the fact that the amount of capital invested has increased much more rapidly than the number of persons employed — that concentration has been accompanied, as in all other industries, by greater use of machinery.

It is well to remark that the special industry under review is by no means young. The "Report" reminds us that during the winter of 1832–33, 85,000 hogs were

slaughtered at Cincinnati, then the centre of the great Western agricultural region, and that at about the same time several packing houses were established in Chicago. In those days slaughtering and packing could be carried on only during the winter and the spring, the meat, so soon as the rivers were again navigable, being floated in flatboats down the Ohio and the Mississippi to be exchanged at New Orleans and other Southern cities for sugar, rice and the like products of Southern states. A large proportion of the pork, hams, etc., reaching New Orleans was then shipped to Baltimore, Philadelphia, New York, Boston and other Atlantic coast cities, which it reached in this roundabout way in much better condition than would have been the case had it been transported by land.

Gradually the centre of the slaughtering and packing industry moved west, following the live-stock industry, until, about 1860, Chicago supplanted Cincinnati and wrested from it the title of "Porkopolis."

Some years earlier the building of railroads had begun in the West. Thus rapid transportation facilities were assured to the industry and it was enabled to concentrate production, a step it had formerly been unable to take because of the undesirability of compelling the live-stock to make long, slow journeys. Concentration, of course, facilitated production, but the greatest revolution in the industry was wrought by the invention of refrigerating processes whereby meat could be slaughtered and packed all the year round and transported long distances, in a frozen condition, without in any way losing its quality. Patents were issued on the first refrigerator car in 1868, and a few years later the great establishments of Chicago and other cities ceased to limit their operations to the packing of pork and extended them to beef packing. Beef, to be sure, was less well adapted to salting and preserving, but thanks to the

invaluable refrigerator cars it could now be transported long distances in the fresh state. Later, and particularly during the past ten years, advances in chemical knowledge permitted the utilization of the blood and many parts of the animal hitherto considered useless and carted away and buried at considerable expense. It is simply and solely owing to the fact that the slaughtering and packing industry has been operated on a large scale in the United States, that the American manufacturers have been able to avail themselves of scientific discoveries and put the by-products to the most varied uses, diminish the cost of production, and sell their wares at a lower price than is possible anywhere else.

"The Union Stock Yards at Chicago," says the "Report," "present a monument to the opportunity and good business sense of the American people." And, indeed, vulgar as this industry appears and unappetizing as are the operations carried out to meet the demands of so many varied tastes, few things testify so impressively to the astonishing capability and the marvellous instinct for organization which have made the United States so powerful from the economic standpoint. Not many years ago I visited the Union Stock Yards and the plants belonging to Mr. Armour, the king of the meat-packing business. I confess that I entered them with some misgivings. But the remarkable organization in evidence and the rapidity and cleverness — if I may use the term — with which the machinery performed tasks in the execution of which it would seem impossible to dispense with hand labor, so fascinated me that my first impressions faded away almost immediately. The Union Stock Yards are a world in themselves. They cover a square mile of land, and contain 20 miles of streets, 75 miles of drainage and water pipes, and 150 miles of railway track, the property of the stock yards company which also owns and operates the locomotives. In

1900 these yards received 8,696,000 hogs, 2,729,000 cattle and 3,548,000 sheep. One-third of the cattle and one-sixth of the hogs and sheep were re-shipped alive. All the rest, to the number of 12,000,000 head, were slaughtered in Chicago.

As a rule, the stock reach the Union Yards in the night or early morning. So soon as they arrive the company operating the yards becomes responsible for them. As soon as possible the herds are driven to pens, and fed and watered, and then the selling begins, amid the greatest confusion of noise that can be imagined. The shouting of brokers, buyers and drivers mingles with the bellowing of cattle, the grunting of pigs and the bleating of sheep, the whistling of locomotives and the rumbling of railway cars, to produce a most fantastic cacophony. But order reigns beneath all and the purchasers soon find their animals and have them weighed and driven to the slaughterhouse. Most frequently a respite of twenty-four hours is given to the cattle and sheep, because they are too heated by the journey to be fit for immediate slaughter. But the hogs are dispatched without any delay.

They are first shackled to chains fixed at intervals to the rim of a huge wheel. As this wheel revolves it lifts them with it, and, as they approach the top they are automatically removed and carried to the butcher by a hook attached to a sloping rail. With a swift, almost mechanical motion, the throat is cut and then, after the blood is allowed time to drain into large conduits which empty into reservoirs, the carcass is run along a few yards and plunged, again automatically, into a bath of scalding water. It is next brought to a table across which it is dragged, by an endless chain, through a scraping machine which removes the bristles much better than would be possible by hand. To ensure perfect results, however, it is then gone over with hand scrapers.

Dismemberment now begins. The head and gambrels are cut, the lard is removed, the body opened, dressed and split in two. And all this is done within five minutes from the time the animal was first attached to the wheel, and at the rate of 20 hogs per minute.

The two halves of the carcass are now taken to the chill room — where the temperature is near zero — in order to get rid of all the animal heat. Twenty-four hours later they are removed from the chill room and taken to the cutting room, whence the different parts intended for curing are sent to the curing room, there to lie for at least two months in dry salt or in vats of sweet pickle.

Of the various products the manufacture of sausage brings the packer a greater profit for the amount of meat used than does anything else. "Sausage," says the "Report," "is made of trimmings which are the remnant of everything." Characteristically enough, sausage is made largely by mechanical processes.

A hog dresses about 80 per cent of its live weight, about 20 per cent being offal, none of which, however, goes to waste. The bristles, the bones, the sinews, the hoofs, everything once deemed useless, is today employed in the manufacture of glue, gelatine, felt, soap, glycerine, anhydrous ammonia, pepsin, oil, knife handles, poultry food, fertilizers and many other things. Every large establishment has chemists constantly employed in seeking new ways to utilize the by-products.

Cattle are handled very much like hogs. After having cooled from their journey they are driven up an incline to the top of a four- or five-story building, are there stunned by a hammer, and are then precipitated to the butchering floor, where they are shackled to a rail which slides them to the butcher. After being killed they are bled and the hide is then removed by hand, a large number of workmen engaging in this task. "Each

workman engaged in removing the hide," says the "Report," "cuts only a portion and the amount done by each is surprisingly small, but this is compensated for in the additional quickness with which the work is accomplished." The carcass is next sent to the chill room, where it is kept for about forty-eight hours when, as a general thing, it is simply divided into quarters and loaded into refrigerator cars for shipment to all parts of the United States and to foreign countries. Only a small portion of the output is salted or pickled.

If the Union Stock Yards are unrivalled either in the United States or in any other country, there are, nevertheless, some famous "meat cities" in North America. Indeed, the slaughtering and packing centres located west and south-west of Chicago have of late years increased in proportion as colonization — and with colonization the live-stock industry and the cultivation of corn, the staple fodder of the live-stock of the United States — has progressed further and further beyond the Mississippi. The four leading centres, outside of Chicago, are Kansas City, St. Louis and St. Joseph, in Missouri, and Omaha, in Nebraska. The following table shows the extent of their operations in 1900:

	Animals received (in thousands).			Animals slaughtered (in thousands).		
	Hogs.	Cattle.	Sheep.	Hogs.	Cattle.	Sheep.
Chicago	8,696	2,729	3,548	7,243	1,794	3,061
Kansas City.....	3,094	1,969	860	2,870	1,116	644
Omaha	2,200	828	1,276	2,163	553	724
St. Louis.....	2,156	795	434	1,643	587	368
St. Joseph.....	1,678	390	390	....	...	....

Thus, there were slaughtered in these five cities some 15,000,000 hogs, more than 4,000,000 cattle and about 5,000,000 sheep. For the past ten years Chicago shows a very small increase in the number of hogs slaughtered annually, a positive decrease in the number of cattle, but an enormous increase in the number of sheep. At

St. Louis, Kansas City and Omaha there has been a general increase, the number of animals now slaughtered annually in these cities being almost double the number slaughtered ten years ago. St. Joseph was then of practically no importance as a slaughtering and packing centre. Evidently the industry has constantly grown in the United States. In order that it may continue to grow at the same rate, however, improvements in the methods of raising live-stock are absolutely essential, for agriculture is now invading, and will doubtless invade with ever increasing rapidity, the very lands which by reason of their fertility are best suited for pasturage.

The table printed herewith will give an idea of the diversity, extent and value of the output of the slaughtering and packing industry in the United States. Weights are given in millions of pounds, values in millions of dollars:

	1890.		1900.	
	Millions of pounds.	dollars.	pounds.	dollars.
Beef, fresh	2,708	152.6	2,920	211.0
Beef, canned	133	8.9	112	9.1
Beef, salted	576	23.3	137	9.6
Mutton, fresh	267	22.0	404	33.0
Pork, fresh	1,125	66.7	1,123	84.0
Pork, salted	1,265	77.7	1,375	88.7
Hams	529	48.7	787	73.8
Smoked bacon, sides and shoulders	666	44.6	986	74.8
Sausage	149	9.3	292	21.5
Refined lard	536	33.4	891	52.6
Neutral lard	105	6.7	129	8.6
Hides	384	21.2	336	33.9
Wool	11	2.0	13	3.3
Oleomargarine oil (mils. of gallons)	16	12.2	19	11.5
Other oils (millions of gallons)	4	3.5	8	3.4
Fertilizers (thousands of tons)	115	2.3	168	3.3
All other products	....	26.1	....	63.2
Total		561.6		785.6

It is at once apparent that, with the exception of mutton and hams, the greatest increase has been in secondary

products, such as lards, sausage and fertilizers. This is due, of course, to the more extensive use of the by-products.

Of this vast output there were exported in 1900, 329,000,000 pounds of fresh beef, 55,000,000 pounds of canned beef and 49,000,000 pounds of salted beef (or a total of 433,000,000 pounds of beef in all forms) worth, in the aggregate, $37,500,000; and 512,000,000 pounds of bacon, 196,000,000 pounds of ham, 26,000,000 pounds of fresh pork, 8,000,000 pounds of canned pork, 133,000,000 pounds of salted pork, and 661,000,000 pounds of lard (or a total of 1,530,000,000 pounds of pork in all forms) worth $112,000,000. Adding $10,500,000 for the value of the oleo exported, $4,500,000 for that of the oleomargarine exported, and $7,000,000 for that of sundry other exportations, we obtain a grand total of $170,000,000 as the value of the exportations of the slaughtering and packing industry of the United States. And to this we might well add the $30,000,000 worth of animals exported.

The two other principal branches of the food products industry are the milling industry and the factory production of cheese, butter and condensed milk. The first, while boasting a product value of $560,000,000, can hardly be called a large-scale manufacture, for the 25,258 establishments reported in 1900 represented an investment of only $218,000,000 — or an average of less than $10,000 per establishment — and gave employment to but 5,790 salaried officials and clerks and 37,000 wage-earners. It is true that technical progress has appreciably reduced the number of wage-earners, who totalled 47,000 ten years earlier. But that the milling is still a small-scale industry is incontrovertibly shown by the fact that (in 1900) 59 per cent of the mills operate on the custom or exchange plan (that is to say, give an equivalent quantity of flour in exchange for

wheat brought to the mill); 31 per cent on the principle of dealing with the patron in exchange or cash as he may desire; and only 10 per cent on a strict cash basis.

This last class, together with a small proportion of the second class, is represented by the large establishments which grind either for urban consumption or for the export trade. Out of 13,188 establishments reported in 1900, 5,500 produced less than 1,000 barrels of flour per annum; 4,310 from 1,000 to 5,000 barrels — which is likewise a small output; 2,584 from 5,000 to 20,000 barrels; 634 from 20,000 to 100,000 barrels, and 135 more than 100,000 barrels. The mills of the last two groups undoubtedly come under the category of large-scale manufacture. They are principally located in the great cereal states — Minnesota, Kansas, Illinois, the two Dakotas, Ohio, Indiana, Iowa. New York likewise boasts a number of large mills.

It is worth observing that not much more rye is milled in the United States than in many countries of Europe, but that a very large amount of corn is milled. The figures for 1900 are: 490,000,000 bushels of wheat, 241,000,000 bushels of corn, 13,000,000 bushels of rye, 12,000,000 bushels of barley, and 8,000,000 bushels of buckwheat. Part of the flour produced from corn is fed to live-stock, but in a number of states corn bread is eaten to as large an extent as wheat bread, while in some of the Southern states it is much more generally eaten than wheat bread.

In discussing the agricultural activity of the United States I had occasion to dwell on the factory production of butter, cheese and condensed milk; so that it is unnecessary to linger on this industry here. Let me recall, however, that of 1,492,000,000 pounds of butter produced in 1900 in the United States, 1,072,000,000 pounds were made on farms and 420,000,000 pounds in factories; and of the 299,000,000 pounds of cheese,

almost the whole quantity — 282,000,000 pounds — in factories; while the 187,000,000 pounds of condensed milk were entirely of factory production. The butter produced had an average value of 18 cents per pound, the cheese of 9 cents, the condensed milk of 6½ cents.

From 1880 to 1899 the number of creameries and cheese factories rose from 4,712 to 9,355, the capital invested from $16,000,000 to $36,500,000, and the product value from $62,000,000 to $131,000,000. As a result, doubtless, of technical progress the number of persons employed in this industry rose only from 12,600 to 12,800; but the amount of wages paid increased by 40 per cent. It is somewhat surprising to find that, according to the census statistics, the number of establishments worked on the coöperative principle has diminished. In 1900 there were only 1,813 coöperative creameries and cheese factories, as against 4,509 operated by individual proprietors, 1,340 operated by firms, and 1,628 operated by corporations. In New England, less than twenty-five years ago, all the creameries were coöperative; now a bare majority remain so. In Iowa, where the coöperative plan formerly prevailed, less than one-third of the factories of the state are today operated on that principle. In Wisconsin, one of the great producing states, there are only 377 cooperative factories out of a total of 2,018; in Kansas only 12 out of 271, and in California only 7 out of 278. It is somewhat odd to find the coöperative principle losing ground in a country where associative enterprises are held in such esteem, and in an industry in which coöperation would seem to enjoy special advantages.

With this our survey of the industries of the United States must come to an end. Many interesting observations might be made in connection with other manufactures than those dealt with in the preceding pages, but enough has been said to make clear the salient features

in the industrial development of the United States and to indicate, in particular, the advantages accruing to the American manufacturers from the ingenuity with which they have applied the principle of division of labor and the use of machinery to the most diverse operations in such a way as to produce goods that will sell at a low price, and still be in a position to pay the highest wages in the world.

CHAPTER XII

THE REWARD OF LABOR

I have frequently had occasion to refer in the preceding chapters to the part played by labor in production, and to the amount and movement of wages in the United States. Were it possible it would be highly interesting to obtain an ensemble view of the conditions of labor in that country; but, if the "Report" is to be believed, it is impossible to secure such a view with any exactness, and this despite the aid rendered by the enormous mass of statistics assembled in the ten volumes from which I have culled so freely.

In the first place, as the "Report" tells us, the manufacturing schedules of the census of 1900 contained but two questions designed to throw light on wages. These were (1) the gross amount paid to labor in the form of wages, and (2) the number of persons employed. It may be thought that the annual wage average might be readily obtained by dividing the total amount paid in wages by the total number of employees. But there are two difficulties in the way of such a simple procedure. For one thing, in many industries the number of persons employed varies greatly with the season of the year. This is particularly the case in the food products and lumber industries. The census officials endeavored to solve the problem thus presented by taking the average number of persons employed throughout the year in a given industry, adding to it the average number of persons employed from month to month, and then dividing the total by twelve. But as a matter of

fact, the total amount paid in wages is a fixed sum, paid, not to the average number of persons employed but to the total number of persons employed, many of them for a few weeks only. Again, while many persons of such temporary employment were idle throughout the remainder of the year, a large number found occupation in other industries. So that even the "averages" are uncertain. Nevertheless, it must be admitted that this is the only possible method of calculation in the case of a good many industries.

The second difficulty arises from the fact that the wage average obtained by dividing the total amount of wages by the total number of wage-earners admits of no distinction being made between the remuneration of the extremely diversified classes of employees occupied in a given industry — between the remuneration, in a word, of those whose labor is purely physical and of those who, like foremen and clever shopmen, intellectually as well as physically forward the operations of the establishment in which they gain their living. To put it otherwise, while it is possible to obtain a sufficiently exact idea of the total amount paid in wages — or the "labor cost" — by American manufacturing establishments, it is impossible to obtain an equally exact idea of the "rate of wages." For the actual number of wage-earners can be ascertained only approximately and it is difficult to classify them into groups of productivity[1] and to show the amount earned by the members of each group.

Notwithstanding all this, the wage average obtained by dividing the labor cost by the average number of wage-earners would be of some value — more especially

[1] In the census of 1890, however, such a classification was attempted, a form of inquiry being drawn up which called for a report on the number of employees in each establishment paid at specified weekly rates of wages running from under $5 per week up to $20 and over per week. Unfortunately, the returns were so incomplete and so unreliable that no inferences of value could be drawn from them, and this form of inquiry was accordingly dropped from the schedules of 1900.

in assisting the student to learn whether the wage tendency was upward or downward — had the statisticians of the different censuses followed a uniform method in obtaining the average number of wage-earners. But they have not done so. In 1900 they divided the persons engaged in manufacture into three distinct groups: (1) proprietors and firm members; (2) officers of corporations, managers, clerks, salesmen, etc., receiving salaries; (3) all wage-earners in the ordinary acceptation of the term. Foremen and master-workmen were included in this last class. Further, manufacturers were asked to report the number of persons employed by them in the course of each month, and from their replies the average number employed throughout the year was obtained. Quite another procedure was adopted in 1890. General superintendents and managers were then grouped with proprietors and firm members, and this although it is difficult to estimate the remuneration of the latter who generally derive their compensation from the earnings of their establishments. And, owing to a misunderstanding of the schedules, a large number of superintendents and engineers, and even of managers and clerks, were classed among the wage-earners, with the inevitable result of raising the wage average higher than it really was. Nor were manufacturers asked to report the number of persons employed from month to month, but simply the average number of persons employed in the course of the year, and it would seem that — at any rate in the case of seasonal industries — the replies referred only to the average number employed during the active season. This, of course, would swell the returns and to a corresponding degree reduce the age average below its true level.[1] Thus there were two dia-

[1] Let us take, for example, an establishment in operation during only six months of the year, and throughout that time giving employment to 300 persons. The average number of employees, if reference be to the average employed during the working season, would thus be 300. And such was frequently the reference in the returns of the 1890 census. But according

metrically opposite sources of error in the statistics of 1890 and 1900, making it extremely difficult to use them for comparative purposes.

However, even with these reservations — and it is absolutely necessary to keep them firmly in mind — the general results of the census inquiries into wages are interesting and worthy of study. It is certainly useful to know that, during the year preceding the census of 1900, the manufacturers of the United States paid to 5,308,406 wage-earners the sum of $2,322,000,000, or an average of $438 per employee; and that, distinguishing between age and sex of these 5,308,406 wage-earners — who included 4,110,527 men, 1,029,296 women, and 168,583 children aged less than sixteen years — the wage average was $491 for the men, $273 for the women and $152 for the children. Approximate tho these figures be they none the less show uncontrovertibly that higher wages are paid in the United States than in France, or even in England. They represent a daily wage of more than $1.50 for the men and nearly $1.00 for the women, and it is certain that such wages are paid on neither side of the Channel.

The census returns thus confirm the common opinion that the wages paid in the United States are, on an average, the highest in the world. I believe I am warranted in saying that this is the case in respect not only to the nominal but to the actual wages. Of the three great needs of man — food, clothing and shelter — the first is assuredly satisfied at less cost in the United States than in Europe, as is the second, for clothes — and particularly machine-made footwear — may be bought

to the method followed in 1900, the average would be 300×6 : 12=150. If the total amount paid in wages be $6,000, the first method would show a wage average of $200, the second, one of $400. The first method would be the more exact of the two if the employees in question are idle while their factory is inoperative. The second, however, is the better if they find employment elsewhere for the remainder of the year, which is usually the case save in respect to specially skilled and highly paid workmen. In any event, the second method affords a better idea of the work-day wage average in a given industry, and avoids duplications.

there at very low prices. Lodging, however, is much higher, and perhaps the additional expenses incurred under this item offset the saving possible in food and clothing. Still, everything considered, there can hardly be any doubt that actual wages, like nominal wages and almost to an equal degree, are higher in the United States than in Europe.

Will wages continue to rise? It is difficult to frame an answer to this question from the information furnished by the different censuses because, for one thing, the definition of wage-earner and the method of estimating the average number of wage-earners have not always been identical; and also because the censuses have been taken at times when strikingly dissimilar economic conditions prevailed. In 1890, for example, business was active and appeared likely to continue so; there had been no serious commercial crises for some time; and wages were higher than ever before.

In 1900 prosperity likewise prevailed. But in the meanwhile the country had passed through a prolonged period of depression, followed by an acute crisis which had caused a general cutting of wages and marked accessions to the ranks of the unemployed. It is well known that after such periods of depression wages rise slowly, just as they decline slowly after the period sets in. Consequently, during 1899–1900 — to which the manufacturing statistics of the latest census generally apply — the preceding lean years were still making their influence felt. These facts explain, in measure at any rate, why the total amount paid in wages increased less slowly from 1890 to 1900 than the number of wage-earners, and why the wage average resultantly appears to have fallen, as is shown by the following table:

	1880.	1890.	1900.
Number of wage-earners	2,732,565	4,251,613	5,308,406
Increase per cent since preceding census	.....	55.6	24.9
Total amount in wages (in millions of dollars)	947.9	1,891.2	2,322.3
Increase per cent from census to census	.....	95.5	22.8
Wage average, general, (in dollars)	346.91	444.83	437.96
men (in dollars)	.....	498.71	490.90
women (in dollars)	.....	267.91	273.03
children (in dollars)	.....	137.53	152.22

The decrease observable from 1890 to 1900 is very feeble (being only 1½ per cent) and applies exclusively to the wages earned by men, the wages paid to women and children showing a positive increase. But small tho it be it applies to all the important industrial groups, except those subject to prolonged seasons of idleness. In the case of the latter (the food products, the lumber, and the clay, glass and stone products industries) the new method of calculating the average number of wage-earners, gives an increase in the rate of wages. But all other industries would certainly seem to show a decrease. This is in striking contrast with the considerable rise apparent in the returns for the two preceding decades.

It is not necessary, however, to draw conclusions unfavorable to the future of American industry. In the first place, as I have already said, the results of the successive censuses are not fairly comparable. So that stress should not be laid on the extremely slight difference between the wages of 1890 and the wages of 1900, as disclosed by the statistics. Again, the elimination in 1900 of a number of high salaried employees formerly classed among the wage-earners has necessarily reduced the wage average. And further, as I have also pointed out, economic conditions were less favorable to labor at the time of the census of 1900 than

at the time of the preceding census. Undoubtedly an increase would have been found had the figures been assembled two or three years later — in 1902 or 1903 — and an increase so appreciable that in place of a wage average slightly below that of 1890 one much higher than the 1890 average would be disclosed. It may also be mentioned that certain industries of secondary importance but giving employment to a great many persons content with small pay, were canvassed much more thoroughly in 1900 than in 1890. "Thus," says the "Report," "in the turpentine and rosin industry the number of establishments reported increased [during the decade 1890–1900] from 670 to 1,503 and the number of wage-earners from 15,266 to 41,864. The average wages paid in this industry were $200.

"It is thus apparent that in all the states where the production of turpentine and rosin is an important industry, the decrease in average earnings is due, not to an actual decrease in these earnings, but to the increase in the number of reports from establishments that paid low rates of wages for unskilled labor." The industry of cotton ginning is another illustration of a low wage industry which was canvassed with care in 1900, whereas in 1890 it was to a greater or less extent identified not with manufacturing but with agriculture. Hence, here likewise wages seem to have fallen, but the contrary is actually the case. The two industries just mentioned are chiefly located in the Southern states, and it is largely on their account that the statistics show for this region a wage decrease of 9 per cent in place of the 1½ per cent decrease for the country as a whole.[1]

All this leads to the conclusion that the apparent diminution in the reward of labor is no reason for uneasiness. And this view is further strengthened by the fact

[1] If we exclude the Southern states, we find that in place of the seeming decrease, the wages paid in 1900 become exactly equal to those paid in 1890.

that the "Report" believes that the statistical increase of nearly 30 per cent for the decade 1880–1890 is very much above the actual increase. At the same time, it must be said that, making all due allowances for the influence exercised by the low wage industries that were wholly or partially omitted by previous census enumerators but canvassed in 1900, the phenomenal rise in wages certainly seems to have ceased between 1890 and 1900. In addition to the economic cause mentioned above, it is my belief that two factors have operated to bring about this altered situation. One is the change in the current of immigration. Dating precisely from 1890 there have come to the United States fewer Germans, English and Scandinavians than formerly but many more Italians, Austrians, Hungarians and Russians, unskilled workers and accustomed to a very low rate of wages. The other factor is the decreasing productivity of American industry, a phenomenon always developing when the manufactures of a country are no longer in their first youth. Gaining relatively smaller profits, manufacturers naturally make a more vigorous resistance to demands for higher wages.

Still another factor which in certain industries has had a tendency to lower the wage average, is the displacement of the skilled operative by machinery that can be managed by a comparatively unskilled hand. In the silk industry, for instance, during the decade 1890–1900 the number of wage-earners rose from 49,000 to 65,000, an increase of 32.5 per cent, and the amount paid in wages from $17,760,000 to $20,980,000, an increase of only 18 per cent; while in the same period the value of the equipment rose from $14,180,000 to $20,750,000, an increase of 46.3 per cent. Similarly, in the leather industry the number of wage-earners rose from 42,000 to 52,000, an increase of 23 per cent, and the amount paid in wages from $21,250,000 to $22,590,000, an in-

crease of a scant 6 per cent; the value of the equipment, on the other hand, rising from $8,000,000 to $15,000,000, an increase of not less than 86 per cent. The same tendency is likewise apparent in the factory production of boots and shoes, and in the carriage, paper and wood pulp, and rubber goods industries.

It is important to observe, however, that the manufacture of the numerous and costly machines which diminish the share of labor in certain industries, of itself creates a considerable demand for labor in the metal working and, consequently, the mining industries. Machinery, indeed, like the sword of Achilles, heals the wounds that it makes. For, by the impulse it gives to production, it positively enlarges the opportunities for labor. At the same time, it would seem to have a tendency to level wages, lowering the highest and raising the lowest. To this, of course, there are exceptions, notably in the case of highly paid engineers and machinists.

I shall not attempt to make a detailed study of the wages paid in the different industries. As the "Report" admits, the statistics are too uncertain to warrant any definite inferences. Moreover, since no attempt has been made to discriminate between the wages paid to the most skilled and the most unskilled workmen, it is impossible to make profitable use of the wage averages, however precisely the latter be ascertained.

It is more interesting to compare the wages paid at a given moment in the different sections of the country. This may be readily done because the same method of calculation was followed and the same questions were put everywhere. First of all, it appears that the rate of wages varies enormously according to the geographical division. The lowest wages are paid in the South, the highest in the West, the annual average per wage-earner ranging from $196 in the two Carolinas to $788 in Mon-

tana, a mining state of the Rocky Mountain region. The variation is most pronounced in the case of male wage-earners, running from $232 in South Carolina to $806 in Montana. In the case of female wage-earners the average varies from $153 in North Carolina to $366 in Arizona; and in the case of child laborers from $96 in South Carolina to $291 in Montana. I append a table showing the average according to each division:

AMERICAN WAGE AVERAGE, ACCORDING TO THE CENSUS OF 1900.
(In dollars.)

	General average.	Men.	Women.	Children.
New England	443.74	507.12	307.34	187.15
Central Atlantic	461.52	528.71	280.75	159.52
Southern	300.81	334.96	183.91	107.20
Central	446.51	488.51	239.86	162.03
Western	543.98	577.09	273.48	175.07
Pacific	526.90	577.11	278.09	181.62

These statistics conform to what might naturally be expected. Wages are lowest in the South for two reasons: large-scale manufacture has only recently been taken up by a hitherto purely agricultural and rather backward people; and the region is largely occupied by former slaves and their descendants, who are still quite primitive. In the West, where wages are highest, industrial development is, to be sure, likewise very recent, as is colonization itself. But the conditions are altogether different. There the population is thinly scattered, and is composed not of backward but of the most energetic and enterprising of people, whose very energy and enterprise have led them to migrate from the old states of the Central and Eastern divisions. Again, in the West the demand for labor greatly exceeds the supply. In the three principal manufacturing regions — New England and the Central Atlantic and Central Inland divisions — wages, as the table shows, approach most closely the general average for the country. Of

the three, the Central Atlantic pays the highest wages to male wage-earners. This is due to the fact that in this division are located a large number of establishments manufacturing articles of luxury or semi-luxury; and that it also contains the two large cities of New York and Philadelphia. Female wage-earners, on the other hand, earn the highest pay in New England, where the textile industry offers them remunerative occupation.

It should be added that in these three divisions — the manufacturing sections par excellence — the wage average is unquestionably lowered to a greater or less extent by the influx of foreigners who come into the country with small means and many of whom — and more particularly the Russian immigrants in New York — locate in cities and engage in sweat-shop work. American born wage-earners as a rule earn much more than these foreigners, and consequently the wage average of the former is above that indicated by the table.

In view of the uncertainty of the census statistics relative to wages, I would now draw the reader's attention to some figures derived from other sources and confirming the conclusions reached from studying the "Report." And, first, I avail myself of E. Lavasseur's *magnum opus* "The American Workingman" which, to be sure, carries a somewhat remote date but which is still, and justly, considered authoritative. Using as the basis for his calculations the annual reports of the Federal Commissioner of Labor, M. Levasseur estimated the yearly income of a wage-earner's family (including not only the wages paid to the head of the family, but the wages, if any, paid to his wife and children, and also including their earnings outside the trade) as follows: the coal mining industry, $550.20 in the United States, $495.20 in Great Britain, and $391.40 in Germany; the steel industry, $663.40 in the United States anl $589 in Great Britain; the wool industry, $663 in the United States,

$515 in Great Britain and $424 in France. In New York city, at the time M. Levasseur wrote, masons were paid at the rate of a little more than 50 cents per hour, for a day of usually eight hours; outside of New York they made about $3.00 per day. Thus, the nominal wages were greatly in excess of the nominal wages paid for the same work in Europe, and M. Levasseur expressed his conviction that the same obtained in respect to the actual wages.

Some interesting information may also be gleaned from the statistics of the Interstate Commerce Commission relative to railways. The commission's annual reports contain a number of tables showing the average daily pay in each of the principal groups into which they divide the 1,200,000 railway employees of the country, and showing this not only for the railway system as a whole but for the ten divisions into which they have partitioned it. The following table has been compiled from their reports:

	Wages.			
Groups.	in 1892.	Minimum between 1892 and 1900.	in 1900.	in 1902.
General office clerks	2.23	2.18	2.19	2.18
Station agents	1.82	1.73	1.75	1.80
Other station-men	1.68	1.60	1.60	1.61
Engine-men	3.68	3.61	3.75	3.84
Firemen	2.08	2.03	2.14	2.20
Conductors	3.08	3.04	3.17	3.21
Other trainmen	1.90	1.89	1.96	2.04
Machinists	2.29	2.21	2.30	2.36
Carpenters	2.08	2.01	2.04	2.08
Other shopmen	1.72	1.69	1.73	1.78
Section foremen	1.76	1.68	1.68	1.72
Other tradesmen	1.22	1.16	1.22	1.25

Thus, seven of the twelve groups had a higher wage average in 1902 than in 1892, and these seven groups contained the largest number of employees. More than this, there was a general increase in wages, except in

the case of the clerks, between the years 1900 and 1902. Numerically, the different groups were constituted in 1902 as follows: general office clerks, 37,570; station agents, 33,478; other stationmen, 105,433; enginemen, 48,318; firemen, 50,651; conductors, 35,070; other trainmen 91,383; machinists, 39,145; carpenters, 51,698; other shopmen, 136,579; section foremen, 35,700; other trackmen, 281,075. The last named are the most poorly paid of all railway employees, and for the obvious reason that theirs is the least skilled labor. Still, they receive $1.25 per day. The ordinary stationmen, as the table shows, receive more than $1.60 per day, and the enginemen almost $4.00 per day. Assuredly these are high wages.

In the railroad, as in all other industries, wages are lowest in the South and highest in the West. The difference is most marked in the case of unskilled labor. For example, in the South-Eastern division trackmen are paid only 93 cents per day, as against $1.41 in the Pacific division. Similarly, stationmen are paid only $1.14 per day in the South-Eastern, as against $2.18 in the Pacific division. In the case of the enginemen the avererage daily wage varies much less sharply, ranging but from $3.50 to $4.58, and, oddly enough, the minimum is found not in the South-Eastern division but in New England. The reason for this, doubtless, is that New England being a great manufacturing region good enginemen are easily secured there, and the abundance of the supply has a tendency to lower the rate of wages slightly.

To conclude: Whatever the authority consulted, the conclusion is inevitable that the wages paid in the United States are the highest in the world, and that, if they are no longer rising rapidly, they still show a general upward tendency. All of which fully corroborates the economic theory that the decisive factor in regulating

wages is the productivity of labor, which is unquestionably more productive in the United States than in any other part of the world. Supported by highly paid but exceedingly capable workingmen and workingwomen, by daring capitalists, by enterprising manufacturers who are always on the qui vive, always in search of improvements; it can hardly be thought surprising that American industry has become the most powerful in the world.

PART FOUR

COMMERCIAL AMERICA

CHAPTER I

THE AMERICAN RAILWAY SYSTEM

The economic revolution wrought by the introduction of the railway may be traced in the history of all countries, but most clearly in the history of new countries, for in such the railway exercises a more significant influence than anywhere else. In the old and densely populated countries of Western and Central Europe the prime value of the railway lay not in stimulating traffic and production, as it has of course done, but in affording an already intense production facilities for exchange. In new countries, of small population, and of a much larger area and a more massive configuration than the countries of Europe, the railway has played a much more important role. It has not only stimulated but created traffic and production, and it has permitted the colonization of sections which would otherwise have long remained undeveloped because of the impossibility of exporting local products to any great distance or of importing commodities necessary not merely to production but to the sustenance of life. It is, indeed, not too much to say that were it not for the railway three-quarters of the immense territory of the United States, far removed from the sea and insufficiently served by rivers and lakes, would still be little more than desert and would be scarcely more influential in the economic life of the world than was Siberia before the construction of the Trans-Siberian Railway began to galvanize it into activity.

From the very first the Americans have appreciated the value of the railway as a factor in the development

of their land. So soon as it was possible for them to make use of this marvellous instrument they employed it far and wide. As far back as 1850, the United States led the world in respect to railroad activity, possessing a greater mileage than France and England together, and, since 1860, than the whole of Europe. More than this, the American railway system is to the fore in technical excellence. The variety of the demands which the railways of the country are called upon to meet, and the necessity of transporting rapidly, at low rates and for long distances, commodities often cumbersome and of little value, but essential to the satisfaction of a local traffic which is all the heavier because of the comparative absence of good roads; all this, together with the fact that competition is exceedingly and constantly active, has obliged the operators of the various lines to seek all possible means of improving the service. Not being hampered by troublesome regulations and as a consequence being in a position to attempt any experiment that may seem good to them, they have pressed the quest for perfection with singularly satisfactory results. They have taken, and continue to take the lead in effecting innovations which gradually find place, or are destined to find place, in the railway systems of the world. Apart from the fact that the study of the traffic handled will materially assist in gauging the country's industrial activity as a whole, here is an all-sufficient reason why the American railway system is deserving of close examination.

According to the latest available "Report" of the Interstate Commerce Commission, the official body which supervises — though by no means strictly — the operation of the railways of the United States, the total mileage of the American lines was, on June 30, 1902, no less than 202,472 miles. This is about 40 per cent of the mileage of the entire world, which, it appears, is

about 475,000 miles; it is much more than the mileage of Europe, which is 175,000 miles; and, finally, it is about nine times the mileage of France.

The work of construction proceeded most rapidly during the period 1870–1890. So soon as the wounds of the Civil War began to be dressed, the Americans scattered railways throughout the trans-Mississippi region, wherein was already to be seen the first trans-continental line, the Union Pacific Railway, which had been opened in 1864. At the same time, the Eastern states were not neglected, new lines being created to meet the demands of the rapidly growing metallurgic and coal mining industries. The heavy and increasing receipts of the various roads soon stirred up competition, until, at the height of the "railway mania," the year 1887 alone saw about 12,500 miles of track laid, or a mileage equal to half of that of the present French system. By 1890 all the great arteries had been constructed, there being today six railway routes whereby the traveler can pass from ocean to ocean.

As a matter of fact, however, too rapid a pace was set, construction running far in advance of traffic demands, and as a consequence a halt was eventually called, the decline in expansion being especially marked on the eve of the great commercial crisis of 1893, as a result of which many railroad companies were forced into bankruptcy. At one time nearly a third of the entire American system was in the hands of receivers. The minimum in construction was touched in 1896–97, when only about 1,650 miles of new road were opened. Returning prosperity saw renewed activity, the years 1899–00, 1900–01 and 1901–02 yielding, respectively, 4,051, 3,892 and 5,234 miles of new road.

In respect to area and population, the American system has a mileage of 6.82 miles of track per 100 square miles of territory, and 25.76 miles per 10,000 inhabitants.

The ratio per 100 square miles will naturally increase, the area of the country remaining constant. The ratio per 10,000 inhabitants appears to have risen since 1899, but it has fallen in comparison with 1893, when it was about 26.50. It is probable that, on a basis of fairly long periods, it will fall still more in the future. Even today the greater part of the country has a widely scattered population, and as a consequence very long lines of railway are required to meet the people's needs. But in many portions of the West the existing roads could by merely augmenting the rolling stock fill the demands of a much heavier traffic than at present exists. And it is, therefore, very likely that they will not extend their lines in proportion to increase in population. So far as concerns the East, it will be necessary only to double or quadruple the tracks of certain roads of an already extremely comprehensive system.

In fine, viewed in respect both to area and population, the American railway system is much more extensive than is the European, and this although, for an equal area, the countries of Europe have four times as many people as has the United States. For each 100 square miles of territory our old Europe can boast not more than 4.50 miles of railway.

Of all the states of the Union, Nevada, the least populous, the most arid, in fact a true desert, is least well provided with railways. Still, with about .75 of a mile per 100 square miles, it has almost as many miles of line to the 100 square miles as has Norway, which is much more populous. Norway, however, is admirably served by the sea. Only two other states, Wyoming and Arizona, have less than 1.50 miles of railway per 100 square miles of territory, or a railway network less tightly woven than that of Russia. It must be pointed out, tho, that like Nevada these states are true deserts and, in large part at any rate, are destined to remain

deserts. Both are very sparsely populated. In the case of Wyoming the population is of a density less than 1 person per square mile, while in that of Arizona it barely passes this figure. European Russia, on the contrary, has a population of more than 30 persons to the square mile. So that it is not proper to compare these two states with Russia as a whole, but with the most impoverished provinces of the Czar's domains, with, say, the sterile steppes of Astrachan, or with the glacial stretches of Archangel.

But, to resume: there are in the United States, out of fifty states and territories, only ten which are less well served by railways than Spain and Portugal. These states, however, have all less than 7 inhabitants to the square mile, while Spain, Portugal, and many countries which are even less well served, have about 48. The least populous and least happily endowed regions in the United States are, therefore, much better provided with means of transportation than a great many European countries of denser population and, in not a few cases, of greater fertility. It is not difficult to imagine how greatly production is stimulated by these facilities for exchange.

If the least populous states are better served than the European countries of small or average population, the more thickly settled states unquestionably possess more railways than does any country in the Old World, with the exception of Belgium. With its 35 miles of line per 100 square miles of territory, that country stands well ahead of New Jersey, which leads the United States with 30 miles. But it must be said that New Jersey has only about 250 inhabitants to the square mile, whereas Belgium has more than 500. Eight states possess a much more comprehensive system than the United Kingdom of Great Britain and Ireland (18 miles per 100 square miles) and none of these approaches the British

Isles in density of population. Fourteen states, including the eight preceding, have a greater mileage than has France, in proportion to area (about 12 miles per 100 square miles). The region in which these fourteen states are situated (the zone bounded by the Atlantic ocean, the Great Lakes and the Ohio and Mississippi rivers, and including Iowa, beyond the Mississippi) has, it should be added, a population only about half as dense as that of France. If, however, population is to be taken as the basis of comparison, the railroad primacy of the United States must be accorded to the sparsely inhabited states of the Rocky Mountain region; and the industrial states of the East, of an extremely dense population and in most cases of a small area, must be relegated to last place.

The situation in Europe is similar, Sweden having the largest mileage in proportion to the number of inhabitants, the ratio being 15 miles per 10,000 persons. In the United States, however, only six states — Maryland and the five contiguous states of New Jersey, New York, Connecticut, Massachusetts and Rhode Island — are behind Sweden in this respect, and only one — tiny Rhode Island — has a smaller mileage in proportion to population than France, Germany, Belgium or the British Isles. The inhabitants of the forty-four other states and territories have at their disposal a much greater mileage than the peoples of any European country, Nevada taking the lead with over 216 miles per 10,000 persons.

Being already so well supplied, it would be only natural for the Americans to cease extending their railway system with the feverish rapidity of yore. It is, therefore, not surprising to learn that from 1894 to 1900 the annual accessions were less than those of Europe, which is much less well provided with railways than is the United States. What is surprising is to find that the Americans still deem it worth while to construct several

thousand miles of new road every year, and that, in 1902, they again passed the peoples of Europe in point of new mileage in operation. This constant expansion would be difficult to explain, were it not due to the rivalry between the different great companies, rather than to the necessity of relieving traffic congestion or of serving new currents of traffic. The operators of the various roads do not hesitate to build lines paralleling those of their competitors, and sometimes running only a few miles, or even only a few hundred yards from them, if they believe they can thus secure some profit direct or indirect, be it only in the way of the more surely leading traffic to the rest of their system.

Since 1900 the increase has been especially large in the agricultural region lying between the Great Lakes, the Illinois and Mississippi rivers, and the 100th parallel of longitude, which marks the beginning of the "dry lands." This zone accounts for about 3,125 miles, or more than one-half of the total, in the mileage increase of 1901–02. The Pacific Slope and Rocky Mountain states come next, with about 1,250 miles between them, and then the group formed by the six Southern states of Kentucky, Tennessee, Georgia, Florida, Alabama and Mississippi, with about as much. On the other hand the increase has been very feeble, and in certain states nil, in the East and North-East.

The question at once arises — How do the Americans make use of this constantly growing railway system? What do their railways carry? In 1901–02 the freight transported by the system as a whole amounted to 581,000,000 tons. This was a little less than the tonnage of the two preceding years, which boasted, respectively, totals of 583,000,000 and all but 594,000,000 tons. These figures, it may be mentioned in passing, refer only to the tonnage originating with each company. In a country like the United States, where the different roads

are very closely interlocked, many consignments necessarily pass over separate lines before reaching their destination. If the company tonnage were to be totalled it would reach, for 1902, an aggregate of not less than 1,200,000,000 tons, an aggregate, however, more imposing than trustworthy for statistical purposes. Of the net aggregate, 304,000,000 tons were accounted for by mining products — that is to say, more than half the total tonnage carried; 68,000,000 tons by forest products; 54,000,000 tons by agricultural products; 15,000,000 tons by animal products; 84,000,000,00 tons by manufactured goods, and more than 56,000,000 tons by "miscellaneous" articles, which were, in the majority of cases, manufactured goods. This shows clearly what an important adjunct the mining industry is to the American railway system. It is worth observing that the poverty of the sub-soil of France is unquestionably a contributing cause in keeping down the tonnage of the majority of our roads, which, in all, carry 110,000,000 tons per year.

So far as passenger traffic is concerned, it is impossible to give any exact figures. All that is available from the official statistics is a round total of 649,878,000 passengers for the year 1901–02, a total obtained by counting every passenger every time he transfers, in the course of his journey, from one road to another. It is possible, however, to establish with exactitude the number of passengers and the number of tons carried per mile, there being no risk of duplications in this respect as each company counts only the number of miles traversed on its own road by each passenger or each ton of freight. For the year 1901–02, then, the ton-mileage of the railways of the United States was 157,289,370,053 and the passenger-mileage 19,689,937,620. These totals are much above the totals of previous years. The gain over 1900–01, for instance, was 8 per cent for the freight

and 12 per cent for the passengers. When the last economic crisis was at its height, in 1893–94, the ton-mileage fell to 80,335,104,702 and the passenger mileage to 14,289,445,893. Before this crisis, the maximum ton-mileage had been 93,588,111,833 and the maximum passenger-mileage, 14,229,101,084, these totals being reached in 1892–93. All of which indicates not merely great activity in the railroad business, but an enormous increase in the production and wealth of the United States during the period under review (1892–1902).

If the traffic of the American be compared with the traffic of the European, and especially of the French railways, a curious and significant fact develops. The number of tons carried is nearly five times as great in the case of the United States as it is in the case of France. This means that the average American ships two and a half times as much freight each year as the average Frenchman, the population of the United States being almost exactly double the population of France. On the other hand, the number of passengers carried is proportionately less in the United States than in France. Thus, while more than 400,000,000 passengers were carried on the French roads in 1901–02, the American roads carried during the same year not quite 640,000,000.[1] As the total population of France is a little less than 40,000,000, and the total population of the United States nearly 80,000,000, these figures indicate that every Frenchman travels about ten times a year and every American only about eight times.

On the surface the fact thus stated seems to be in direct contradiction to generally accepted ideas. But, in

[1] The numbers given are, in both cases, obtained by totalling the number of passengers carried by the different roads. A traveler who, in the course of his journey, is obliged to make use of two or three roads, is thus counted two or three times. Duplications and reduplications must be much more frequent in the case of the United States than in the case of France, the railway systems of the former country being much the more closely interwoven and the companies much the more numerous. This means that the number of American travelers, in comparison with the number of French travelers, is really much lower than would seem to be the case at first glance.

the last analysis, it will be found that the American is, after all, the greater traveler. The statistical difference is due to the fact that the United States possesses an extremely well developed electric railway and street-car system (the figures pertaining to which are not included in the ordinary railway statistics) which enjoys a virtual monopoly of the suburban service, and even of the interurban service when towns are not far apart. Massachusetts, for example, an exclusively industrial state of an almost wholly urban population, has a much more extensive system of electric than of steam railways. So that the American railway system in large measure fails to receive a patronage secured by the railway systems of France and the majority of European countries; though, to be sure, the patronage of this type which it does receive is in excess of the similar patronage received by our roads. If it be true, as has been said, that social as well as individual progress, consists in an increasing differentiation and specialization of organs, the American system of providing distinct means of transportation for short distance and long distance travel, is assuredly a sign of progress. It relieves the railways proper from a task which handicaps them in the proper performance of their real mission — the transportation of persons and merchandise for long or fairly long distances — and a task which it is difficult for them to execute economically.

As is to be expected, both travelers and freight make longer journeys in the United States than in France. The average journey of the American passenger is 30.30 miles. This is only a little above the average journey of the passenger on the Lyons, Orleans and Southern roads of France (29 and 28.50 miles) but it is much above the average journey of the passenger on our Western, Eastern and Northern roads (13.50, 16.25 and 17.50 miles, respectively), which are to no small extent occupied with suburban business. These averages, it should

be pointed out, are based on the length of journey over a single company's line. Of course, if the passenger make use of several lines his real journey is much longer, the difference naturally being all in favor of the United States as compared with France. The average journey of a ton of freight (but in this case taking all the connections effected into account) is also much longer in the United States than in France, more than three times as long, in fact, being about 270 miles against less than 90. This is explicable by the difference between the areas of the two countries, and by the enormous distances which, in the United States, separate many of the great agricultural and mining sections from the centres of consumption and ports of exportation. This, however, is a distinct advantage to the American railways, because the expenses involved in loading and unloading, and which remain constant whatever the length of the journey, bear less heavily the longer the "haul."

The railway traffic of the United States is thus quite differently constituted from the railway traffic of France, there being proportionately more freight and proportionately fewer passengers carried by the American roads. In order to obtain a clear idea of the extent of the difference, let us look again at the statistics having to do with the passenger-mileage and the ton-mileage. As we have seen, the number of passengers carried 1 mile by the different American railroad companies in 1901–02 was 19,689,937,620. This, in other words was the total number of miles traversed by all passengers in the course of the year. The total length of the lines over which these passengers journeyed was 200,154 miles.[1]

From this it follows that every mile was traversed by an average of 98,000 passengers. During the same year

[1] As was said on another page, the total length of the railways of the United States in 1901–02 was 202,472 miles; the information obtainable, however, is sufficient to establish the length, for statistical purposes, for only 200,154 miles.

our six great companies carried 8,812,500,000 passengers 1 mile over 21,250 miles of track, or an average of 415,000 passengers per mile. In regard to freight, however, there were transported in the United States, during the same year, 157,289,370,053 tons, or 793,351 tons carried 1 mile per mile of line. The six large French companies handled only 9,685,000,000 tons, or 450,000 tons per mile of line. This is little more than half the 793,351 tons carried per mile of line by the American companies. Many fewer passengers, much more freight in proportion to the length of the lines; a longer average journey for both passengers and freight; such are the characteristics distinguishing the American from the French railways.

If we have dwelt on these characteristics, it is in order to have them clearly in mind when the question of rates is discussed. They have a distinct and important bearing on this question. Other things being equal, the superior importance of the freight traffic, and the greater length of the "hauls" allow the operators of American railways to make to consignors concessions which it would be quite impossible for the operators of our roads to offer. The cost of operation is also lowered by the cheapness of fuel, and is still further decreased by the abundance of such commodities as coal, minerals and raw agricultural products which, being shipped by the carload, require much less handling than does ordinary merchandise. Having mentioned the natural factors contributing to make American freight rates lower than ours, it is only fair to add that the sound business qualities of the operators, their ingenuity, their readiness to avail themselves fully of technical improvements and, in a word, the general excellence of their administration, have all played a part in making the prevailing extremely low rates possible.

In 1901–02 the average return to the railways of the

United States per ton per mile was .757 of a cent. In France the rate is almost as much again, tho it must be remembered, not for the same class of goods, our traffic having a much larger proportion of costly and delicate commodities — that is to say, of commodities for which a rate above the average would naturally be demanded. American freight rates, it is worth noticing, have fallen greatly during recent years. In 1891–92 the average return was .898 per ton per mile; by 1898–99 it had decreased, through a gradual decline, to .724. Since then, prices and profits having generally increased under the influence of a widespread prosperity, and the railroad companies having also increased the wages of their employees, they have deemed it possible to raise their rates slightly. It might be difficult to establish such a tariff increase in Europe; but in the United States where the roads are operated on a more strictly business basis, concessions are made in times of depression, and it is, therefore, not at all difficult to fix a slightly higher rate in periods of prosperity, when the purse is better filled and business active. This custom of charging what the traffic will bear is perhaps preferable to the Continental method, since it means a lowering of rates when prices and profits are falling. Moreover, as we have just seen, it does not prevent a general tendency in the direction of lower rates.

Varying in time, the freight rates of the American railway system also vary in space, according to the different geographical divisions, on account of variations in the character of the commodities handled, the cost of fuel, the wage bill and the volume of trade. Of the ten territorial groups into which the United States is divided in the statistical analysis of the Interstate Commerce Commission, that which shows the lowest average rate is the third group, which includes, lying between the Ohio river and the Great Lakes, the states of Indiana and

Ohio, the southern portion of Michigan and the extreme western section of Pennsylvania. This is a region of blast furnaces, of cheap coal, and of a very heavy traffic. Here the average rate is only .576 of a cent per ton per mile. In the fourth group — comprising Illinois, Iowa, Wisconsin, upper Michigan, Minnesota, and the larger part of the two Dakotas — where fuel is still cheap, and where the railways carry in addition to cereals much coal and ore, the rate is also very low, being but .650 of a cent per ton per mile.

It is about the same in the second group, which includes New York, New Jersey, Maryland and the larger part of Pennsylvania. Here hard and soft coal and mineral products predominate in the traffic, and here fuel is always cheap. Everywhere else the rate is above the general average. It is well beyond .950 of a cent per ton per mile throughout the region situated west of the Missouri and of the lower Mississippi — that is, throughout more than half the entire area of the country. And, at the opposite extremity of the Union, in the New England group of states, where industry is most diversified, where production includes many small articles, and where fuel is extremely dear, it attains 1.172 cents per ton per mile. This is almost the average rate of our Northern road which, it must be admitted, is the road exacting the lowest rate in France.

While American freight rates are low, American passenger rates are, or appear to be, very high, the average return from passenger traffic being 1.986 cents per passenger per mile, while the average for France is less than .800 of a cent. Nor do the receipts of the American companies include the fares charged for accommodation in parlor and sleeping cars, which are operated by outside corporations, mainly by the celebrated Pullman Company. Now, since there is only one "class" of car on the American roads — except on some Western roads —

these parlor and sleeping cars take the place not only of our special but of our "first class" cars, and many fine express trains are composed of them exclusively. In France, it is true, a certain amount is annually diverted from the railroad companies to the Sleeping Car Company, but the aggregate loss to the roads is infinitely less in France than in the United States. All in all, therefore, the actual passenger rate in America is much above the figure quoted. It may be added that the tendency to reduce it is much less noticeable than was found in the case of the freight rate. In 1892, the rate was 2.126 cents per passenger per mile, and in 1899 it touched the minimum, 1.925 cents. Its maintenance is explained, first by the extremely high price obtained in the United States for everything in the nature of personal service; and, secondly, by the comparative deficiency in suburban business. In France, as we have seen, the railroad companies enjoy a very heavy suburban traffic, and it is to the commutation tickets issued in connection therewith that the low average rate of the French roads is due.

But let us return to the freight, which plays far and away the more important role in the economic life of the American railways. How is it possible, one may ask, for the various lines to carry goods at the extremely low rates quoted above? The question is easily answered. For one thing, the rolling stock is skilfully adapted to the needs of the traffic; for another, the rolling stock is handled to the best possible advantage. In 1901–02 the railroad companies of the United States possessed, according to the "Report" of the Interstate Commerce Commission, 41,225 locomotives, 36,987 passenger cars, 1,546,101 freight cars, and 57,097 cars for special purposes. Like the traffic, the rolling stock has been growing rapidly of late years. In 1894 it included only 35,492 locomotives, 33,018 passenger cars, 1,205,169 freight cars, and 39,891 private cars.

At first glance these figures do not seem at all large in comparison with the statistics of the rolling stock of the six great French companies which possess, for a far shorter mileage, 10,000 locomotives, 26,000 passenger cars and 260,000 freight vans and cars. But the round totals by no means indicate the difference between the transportation facilities of the two systems. The passenger cars of the United States are long carriages mounted on bogie-trucks, and strongly reminding one of the fine "first class" passageway, seven compartment cars recently installed on the greater part of the French system. The freight cars of the American lines are quite up to the standard of the passenger cars. While in France as a general thing, cars of but 8 to 10 tons capacity are employed, the average capacity of the American freight cars is 28 short tons, or more than 25 metric tons. The total capacity of the 1,546,000 freight cars is thus 38,000,000 metric tons. There are only 57,000 cars with a capacity of less than 40,000 pounds, and their total capacity represents only 2 per cent of the freight carrying capacity of the entire system. On the other hand, the cars of more than 27 tons have a total capacity of 26,000,000 tons, or of more than two-thirds of the aggregate capacity. Among these are to be found 158,000 cars of from 36 to 40 tons capacity, carrying in all 5,750,000 tons; and 49,578 cars of more than 40 tons capacity, carrying 2,250,000 tons. The capacity of these last two classes, taken together, constitutes 21 per cent of the total capacity of all lines.

Cars of such a size considerably facilitate operation. For the same weight, a train made up of cars like these carries much less dead weight than a train composed of small cars, and can therefore be run at greater profit. Moreover a train thus made up, is much the shorter because it has fewer links; and, for that very reason, it is much the more safely operated. All of this explains how

it is that the Americans have found it possible to increase the weight of the merchandise carried by their freight trains. In 1901–02 the average per train was 296 tons, as against 281 tons in 1900–01 and 270 tons in 1899–1900. In 1896–97 the average was only 204 tons, and in 1891–92 only 181.

In 1901–02 the freight-train mileage of the American roads was 499,711,176 miles, as against 491,942,041 miles in 1900–01, 492,568,486 miles in 1899–1900, 507,841,798 in 1898–99 and 503,766,258 miles in 1897–98. Thus, since 1898–99, the tonnage has increased by 14 per cent (from 510,079,200 tons to 581,832,441); the number of ton-miles has increased by more than 25 per cent (123,667,257,153 ton-miles to 157,289,370,053 ton-miles); but, thanks to the increased load per train, the number of train-miles has decreased. Here is a signal triumph in railroading. If we go a little further back, as far back as 1891–92, we find that the number of ton-miles was then but 88,241,050,225. This means that the ton-mileage has increased, in ten years, by more than 80 per cent. The number of train-miles in 1891–1892 was 485,402,369. The increase in train-mileage, to 1901–1902, is thus only 3 per cent. Truly extraordinary has been the progress made during the decade.[1]

In 1901–02 the American railway system utilized the services of 1,189,000 employes of all types. In proportion to the extent of the two systems, this is a smaller operative force than that employed by the French roads, which have a total of more than 250,000 employees. The American personnel has varied greatly during the ten years under review. In 1892–93 it numbered 873,000 individuals; the following year, under the influence of

[1] The passenger train-mileage has increased far more than the freight-train mileage. From 317,538,883 train-miles in 1891–92, it rose to 405,613,231 train-miles in 1901–02. The number of passengers per train has varied only slightly, rising from 42 to 45 during the decade. It need hardly be pointed out that the "carload" ideal is not applicable to the passenger service, and has not been sought.

"hard times," the aggregate fell to 779,000. It gradually rose again, but not until 1897–98 did it reach the figure of 1892–93. Since then, business having grown rapidly and the companies being obliged to undertake improvements which, for economy's sake, they had postponed to a period of returning prosperity, the number of employees has risen quickly, increasing, in fact, by more than a third in four years. The system adopted in regard to rate-fixing prevails here. Salaries and wages increased during the four years, 1898–1902, far more than did the personnel, rising from $495,000,000 in 1897–98 to $676,000,000 in 1901–02. Of the 1,189,000 persons employed during the latter year, 41,000 were engaged in the general offices of the several companies, 399,000 in the stations and the care of the tracks, 228,000 in looking after the rolling stock, 518,000 in operation proper, and 2,000 in miscellaneous occupations. The increase of the four years was especially noticeable in the track division of employees. This was due, of course, to the many improvements necessitated by traffic growth, or postponed during the period of depression, 1893–1897.

The gross receipts per mile amounted in 1901–02 to $8,625, as against $7,213 in 1891–92. In 1893–94 and 1894–95 the receipts touched the minimum for the decade with $6,109 and $6,050 respectively. The operating expenses per mile were $5,577 for 1901–02, as against $4,809 in 1891–92 and $4,163 and $4,083 in 1893–94 and 1894–95. The curve for both receipts and expenses is thus about the same. Compared with the French roads the operation of the American lines is much the more expensive. Moreover, the gross earnings are less in America than in France, where they exceed $12,000 per mile for the great companies. This fact, however, need occasion no surprise, the enormous difference in the density of the two populations being kept in mind.

The following table, borrowed from the "Report" of the Interstate Commerce Commission, will assist in forming a clear idea of the financial status of the American railroad system. The values are in millions of dollars, and exhibit the results of operation during the year 1901–02:

Gross earnings from operation	1,726.4	
Clear income from investments	43	
Gross earnings and income		1,769.4
Operating expenses	1,116.2	
Salaries and miscellaneous expenses	.5	
Total expenses		1,116.7
Net earnings and income		652.7
Net interest on funded debt	260.3	
Interest on current liabilities	7.7	
Taxes	54.5	
Total interest and taxes		332.5
Available for dividends; adjustments and improvements		330.2
Net dividends		157.2
Available for investments and improvements		173

Under the last heading, are included the following items: Permanent improvements, $35,000,000; advances to cover deficits in the operation of weak lines, $5,000,000; miscellaneous deductions, $38,000,000. This leaves an actual surplus of $95,000,000 available for the reserve fund, etc.

This statement indicates that the American railway system is in a perfectly sound condition financially. The expenses of operation and the taxes paid, there remains a gross profit of nearly $600,000,000, of which but $268,000,000 are absorbed by interest. There is thus left a surplus of $330,000,000, less than half of which is appropriated for the payment of dividends. The bonds are thus safely protected, and may be said to be strongly guaranteed in general. They amount in all to more than $6,000,000,000, and the average return is therefore nearly 4½ per cent. In regard to the shares, however,

which also aggregate $6,000,000,000, it must be said that the return is little above 2½ per cent. Much of the stock, tho, and especially of the common stock, does not represent capital that has really been paid in. Moreover, the total of $6,000,000,000 contains many duplications, a number of companies possessing a majority, and in some cases possessing all, of the stock of subsidiary companies. All in all, the prosperity of the American railway system, as well as the excellence of the service it renders, is undeniable. If, therefore, one were in search of model railroading methods, it would be wise to turn to those practiced under the free American system, not to those illustrated by a system operated under the debilitating control of the state.

CHAPTER II

THE AMERICAN FOREIGN TRADE

It need hardly be said that the foreign trade of the United States is the best index to the effect the prodigious development of that country has had upon the world. During the fiscal year 1903 [1] it amounted to $2,446,000,000, giving the United States third place among the great trading nations, not far behind Germany, whose foreign trade for the same period aggregated $2,600,000,000; outdistanced only by Great Britain, with a foreign trade of $4,400,000,000; and well ahead of France, which had a foreign trade of only $1,700,000,000. Moreover,—and connoting an entirely novel feature of the world economy — since 1901 the United States has outranked all other countries in point of export trade. With its $1,392,000,000 of exports for the fiscal year 1903 it was slightly ahead of Great Britain, far in advance of Germany which did not have quite $1,200,000,000 of exports; and still further in front of France, which could boast little more than $800,000,000 of exports. Thirty years earlier each of these three countries ranked well above the United States, which at that time did not export quite $375,000,000 worth of products, whereas France exported $560,000,000 worth, Germany $570,000,000 worth, and Great Britain $1,000,000,000 worth.

I lay stress on these figures because when economic questions are the subject of discussion it is important to have clearly in mind the sweeping changes effected, in a comparatively short time, in the distribution of the

[1] The fiscal year begins July 1 and ends June 30.

world's centres of consumption and consequently in the direction of currents of trade. But I most decidedly do not lay stress on them because they indicate changes of an astonishing character. There is, indeed, nothing surprising in the fact that the growth of the United States during the last three decades of the nineteenth century was more rapid than the growth of any European country, and that, among European countries, Germany progressed more rapidly than did either Great Britain or France. On the contrary, the superior development of both the United States and Germany was due to factors quite independent of man, and which would have failed to operate only had the inhabitants of the United States and Germany been far inferior racially to the English and the French people.

A very few words will suffice to make this clear. For one thing, the exploitation of the riches of the soil and the sub-soil was in 1870 far more advanced in Great Britain and France than in Germany or the United States. At that time there were few new mines to be opened and little virginal soil to be worked in the two former countries, while Germany still had much undeveloped mineral wealth and the United States had both new mines and new lands. For another thing, the population of France has remained almost stationary since 1870 and that of Great Britain has increased only 30 per cent; while the population of Germany has increased almost 40 per cent and that of the United States has doubled. Thus, for thirty years and upwards the United States and, tho to a less degree, Germany, have been much more favorably situated than either Great Britain or France in respect to two of the three factors in production — nature and labor. Nor has it been difficult for them to secure the third factor — capital — to whatever extent desired, their great natural wealth and their constantly increasing supply of labor, enabling them to borrow freely from

abroad. These being the facts, it is easy to understand why the export trade of the United States has quadrupled since 1870 and that of Germany has doubled, while that of France and of Great Britain has increased by merely one-half. Indeed, there is even reason to feel satisfied with our comparatively slow commercial progress in view of our small increase in population and our poverty in the mineral resources which play such an important role in the economic life of today.

However it may be, it is apparent that the foreign trade of the United States has increased more rapidly than that of any other country, and that this increase has for the past thirty years been chiefly in the export branch. Throughout the first three quarters of the nineteenth century — with the exception of the years 1858, 1862 and 1874, when the exports slightly exceeded the imports — the export trade of the United States was inferior to its import trade. And how slight was the excess in the years mentioned will be understood when it is stated that for the period as a whole the excess of imports over exports amounted to $1,500,000,000. Like all new countries still in what may be termed the pioneer stage, the United States bought much more from the foreigner than it sold to him. This state of affairs was prolonged by the Civil War which on the one hand arrested production and on the other necessitated heavy imports wherewith to repair the havoc it had wrought. But in 1876 a change became apparent. Thanks to the equipment with which they had supplied themselves the people of the United States, so soon as the war's wounds were healed, were in a position to increase their production enormously, and throughout the last quarter of the century — with the exception of the years 1888, 1889 and 1893 — the yearly balance was all in favor of the exports. The excess was particularly large for the last four years of the century, and for the period 1876–1900

was more than $3,400,000,000. For the first three fiscal years of the twentieth century it was $1,537,000,000 and for the fiscal year 1900 alone was $664,000,000.

There is no occasion to dwell on the years when the United States was an importing rather than an exporting country. But some statistics may be cited to show the rate at which it has progressed. In 1851 its foreign trade comprised $189,000,000 of exports (including $10,000,000 of re-exports) and nearly $211,000,000 of imports, or a total of $400,000,000. In 1860, the most prosperous ante-bellum year, the exports amounted to $333,500,000 (including $17,000,000 of re-exports) and the imports to $353,500,000, or a total of $687,000,000. The war immediately caused a halt. In 1862 the exports fell to $190,000,000 and the imports to $189,000,000. Three years later the exports, as a result of the complete abandonment of the cotton plantations, touched their lowest point — $166,000,000, which included not less than $29,000,000 of re-exports. In the same year, however, the imports rose to $238,000,000. So soon as the war was at an end national development began anew, and with increased momentum. In 1872 the country's foreign trade passed the $1,000,000,000 mark, never to fall below it again. In 1874 the exports amounted to $586,000,000, of which a scant $17,000,000 represented the value of the re-exports; and the imports to $567,000,000, a total of $1,153,000,000, as against $1,164,000,000 in the preceding year, when the imports had an aggregate value of $642,000,000. The fiscal year 1873 was thus a record year for both imports and foreign trade as a whole, and remained a record year until 1880 when the exports, which had shown an almost constant yearly increase, reached $835,000,000 and the imports $668,000,000, or a total of $1,503,000.

The following table shows the yearly average by five-year periods of the foreign trade of the United States

from 1880 to 1900, and the actual yearly trade for the fiscal years 1901–02–03:

FOREIGN TRADE OF THE UNITED STATES FROM 1880 TO 1903.
(In millions of dollars.)

	Exports.	Imports.	Total.
1880–1885	791.6	677.1	1,458.7
1885–1890	737.9	712.2	1,450.1
1890–1895	892.1	777.5	1,669.6
1895–1900	1,157.3	741.5	1,898.8
1901	1,487.8	823.2	2,310.9
1902	1,381.7	903.3	2,285.0
1903	1,420.1	1,025.7	2,445.8

The distinctive characteristic of the period 1880–1900 was the relative stagnation of the import trade, a stagnation, indeed, which dated back to 1873 when there were imported goods to the value of $642,000,000, a value exceeded by only $55,000,000 twenty-seven years later. In the interim, to be sure, the fiscal year 1893 saw importations to the value of $854,000,000. But the commercial crisis which then developed speedily lessened the purchasing power of the American people, and consequently their import trade declined sharply. We find that the export trade likewise passed (1880–90) through a period of relative stagnation, in marked contrast with the progress of the preceding decade. But in the fiscal year 1892 not less than $1,030,000,000 worth of products were exported. Like imports, however, the exports fell away during the period of depression that ensued, dropping to $807,000,000 in 1895, but this was at once followed by another phenomenal advance from 1896 to 1901. Since then the export trade has remained stationary, has even shown a tendency to decline, while, under the influence of increasing prosperity, the import trade has continued to rise ever since 1899, attaining new high-level marks in 1902 and 1903. Even so, the increase in the latter for the past twenty-five years is

considerably below the increase in the former for the same period.

In being preeminently an exporting country the United States is radically differentiated from the old commercial countries of Europe — England, France and even Germany, which, altho young in comparison with its two westerly neighbors is old compared with the United States. These three European countries — which have abundant capital, which are only to a small extent in the foreigner's debt, whereas the foreigner is greatly indebted to them; and which have a population so dense that the domestic production is unable to supply its wants — buy far more than they sell, settling the balance against them with a portion of the interest on their investments. On the other hand, the United States — which still owes much to Europe on railway bonds and mortgages, and which has hardly any capital invested abroad, finding it more profitable to expend its money on national development — pays the interest on, and even reduces the principal of, its railway and mortgage indebtedness by means of its foreign trade surplus. And, so active is the agricultural and manufacturing life of the United States, the export trade will doubtless long continue to be heavier than the import trade.

Little need be said of the re-export trade. As is well known it contributes largely to the foreign trade of England, Belgium and Holland, and, tho not to such a great extent, to the foreign trade of France and Germany. But it is a very small item in the United States, owing to the geographical position of the country. Of the $1,420,000,000 worth of products exported from the United States in 1902, articles of foreign origin accounted for less than $28,000,000, the remaining $1,392,000,000 representing exports of wholly native production. Still further, with the exception of 1865, when

the re-export trade amounted to $29,000,000, 1902 was the record year in this branch of the foreign trade.

Let us now examine that trade in some detail, beginning as is customary, with the import trade. As we have seen, this has augmented enormously during the past few years. Coinciding as it does with a remarkable increase in domestic production, this upward movement would seem to indicate that however the industrial development of the United States may menace Europe's export trade in other markets it will not have the effect of restricting that trade in the American market. As a matter of fact, the richer the Americans grow the better customers of other countries should they become. When everybody is prosperous and earning plenty of money, imports, as the Commercial and Financial Chronicle of New York justly remarks, must necessarily increase all along the line, there obviously being a greater demand not merely for articles of necessity but also for articles of luxury. It is the universal teaching of experience that the more productive a nation the more freely it buys abroad. It is true that there may be a decline in respect to certain commodities but this is more than offset by the appearance of new media of exchange, and the import trade as a whole becomes both more diversified and more extensive.

From figures contained in the monthly summaries of commerce and finance published by the United States Treasury department, I have compiled the following table which, thanks to the ingenious classification adopted by the American statisticians, will assist the reader in obtaining an idea of the changes undergone by the import trade of the great Republic during recent years:

IMPORTS OF THE UNITED STATES FROM 1880 TO 1903.
(In millions of dollars.)

	Articles of food and animals.	Articles in a crude condition.[1]	Articles of luxury.	Articles wholly or partly manufactured.[1]	Articles manufactured, ready for consumption.	Total.
1880.....	199	160	73	130	65	628
1885.....	194	120	72	119	74	580
1890.....	249	178	85	154	107	774
1894.....	276	127	66	99	69	637
1900.....	216	299	81	131	104	831
1901.....	214	271	75	135	113	808
1902.....	201	328	91	151	133	903
1903.....	218	375	114	170	148	1,026
		PERCENTAGES.				
1880.....	31.7	25.5	11.7	20.7	10.4	
1885.....	33.5	20.6	12.5	20.5	12.8	
1890.....	32.1	23	10.9	20	13.9	
1894.....	43.3	19.9	10.3	15.6	10.9	
1900.....	26	36	9.7	15.7	12.5	
1901.....	26.4	33.5	9.3	16.8	13.9	
1902.....	22.2	36.2	10.1	16.7	14.7	
1903.....	21.2	36.6	11.1	16.6	14.4	

Comparing the figures for 1903 with those for 1880, it is at once seen that the increase has been almost entirely confined to three classes — raw materials imported for manufacturing purposes; articles wholly or partially manufactured and likewise intended for use as materials in the manufactures and mechanic arts, and articles of luxury. This is significant in the highest degree. The increase in the first and second class is the natural result of great industrial progress. Similarly, the much more rapid increase shown by the first as compared with the second class, is due to the increasing domestic manufacture of the machinery and semi-manufactured articles

[1] For use as materials in the manufactures and mechanic arts.

essential to industry. The increase in the third class, it need hardly be said, arises from the increasing wealth of the country.

Toward the middle of the twenty-five year period under review occurred the commercial crisis to which I have already referred and in consequence of which all imports, with the exception of food-stuffs, declined sharply. Even the food products class would have shown a decrease had it not been for the heavy importation of sugars and other commodities the duties on which were lowered at that time.

Let us now examine severally the different classes of imports, beginning with the articles imported in a crude condition for manufacturing purposes. In this connection the following table will prove useful, and it is all the more interesting as constituting an index to American manufacturing progress:

PRINCIPAL ARTICLES IMPORTED IN A CRUDE CONDITION BY THE UNITED STATES.

(In millions of dollars.)

	1880.	1890.	1900.	1901.	1902.
Vegetable fibres	9.4	20.5	26.4	22.9	31.5
Raw silk	13.8	24.3	45.3	30.0	42.6
India rubber and gutta	9.6	14.8	31.8	28.8	25.1
Hides and skins	30.0	21.9	57.9	48.2	58.0
Furs	2.5	2.2	6.6	6.3	9.8
Chemical products	41.4	41.6	54.7	53.5	57.0
Wool	23.7	15.3	20.3	12.5	17.7
Cotton	0.6	1.4	8.0	6.8	12.2
Wood	8.4	13.5	15.8	15.6	20.3
Tin	6.2	6.9	19.1	19.8	19.5
Iron and steel	27.0	8.1	5.5	3.8	10.0

Thus, the only items to show a decline in a period extending over more than twenty years, are wool and iron. The decrease in wool imports is due partly to the imposition of a high tariff and partly to the increase in the number of sheep in the United States. The decrease in iron imports is the result of the enormous improvements

effected in American blast furnaces. And it may be said in passing, that it would seem certain that from this time forward American iron manufacturers should be able to fill all home orders except, of course, in years of extraordinary activity — such as was 1902. The heavy import trade in cotton — an article one would not naturally expect to find imported in quantity into this cotton-growing country par excellence — is explained by the fact that the American cotton-goods industry is exceedingly diversified, and requires a great deal of Egyptian cotton for the manufacture of certain articles of a fine quality. It may be added that as a result of the general decrease in prices, imports have increased much more in amount than in value. This is notably the case with silk, the imports of which into the United States have risen from 2,500,000 pounds in 1880 to more than 14,000,000 pounds in 1902.

The food importations consist largely of tropical products for the cultivation of which the climate and soil of the United States are not adapted. Lack of space forbids any analysis, but it may be said that the general tendency has been in the direction of heavier imports. Some interesting exceptions are observable. For example, tea exports have almost steadily fallen off since 1875, amounting in value, in 1902, to only $9,000,000. Other of the leading food imports in 1902 were: coffee, $71,000,000; cocoa and chocolate, $7,000,000; fruits, $21,000,000; vegetables (early growths from Bermuda and the West Indies), $7,000,000. There was also imported in the same year $9,000,000 worth of wines — a gain over 1894 but a decrease compared with the $10,000,000 worth imported in 1892 and 1893 — and $4,500,000 worth of spirits, the importation of which has increased year by year. The most striking fluctuation is in the case of sugar. In 1901, $91,000,000 worth of sugar and molasses was imported into the United States, but

the following year only $56,000,000 worth, the decline being due solely to the fact that would-be purchasers were holding back until the tariff reduction on Cuban sugars should go into effect.

I have already said that manufacturing progress has not caused any diminution in the purchases abroad of manufactured articles. Of the different textiles — which constitute the principal division of this class of imports — $28,000,000 worth of cotton goods was imported in 1892; $44,000,000 worth in 1902 and $52,000,000 worth in 1903. In 1892, silk importations amounted to $31,000,000; in 1902 to $32,500,000, and in 1903 to $36,000,000 — of which $16,000,000 represented purchases from France. In this case the development of a native industry has undoubtedly operated to retard the growth of imports. Singularly enough, however, a profound decline is seen in wool imports only, the import value in 1903 being but $19,000,000, as against $35,000,000 in 1892. Yet the wool industry has made the least progress of any American textile manufacture. The reason for the decrease in the import trade in wool must therefore be sought elsewhere than in the growth of home manufactures. It will be found in the fact that comparatively less wool is used today than was the case formerly. The import trade in leather goods shows a slight decline, the figures being $13,000,000 for 1892 and $11,000,000 for 1902 and 1903. Among articles of luxury properly so called, the import trade in jewelry has grown from $14,000,000 to $26,000,000, while the trade in porcelains remains stationary at about $9,000,000 per year. These figures warrant the belief that, except in times of profound economic depression, the United States will continue to be a splendid market for the manufacturers of Europe.

The most significant feature for Europe is, however, the rapid increase in the export trade of the United

States. Throughout the closing years of the nineteenth century this was the most striking characteristic of the foreign trade of that country, and it remains the most striking characteristic today. But it is only the natural result of the extraordinary development of the country's productive power. Everybody knows the alarm created in Europe — particularly during the years 1900 and 1901 — by the so-called "American invasion." The Old World felt that it was about to meet the competition of the manufactured products of the New, just as it had for many years been forced to compete with the latter's agricultural products. And the prospect threw it into a panic. Since then its fears have subsided owing to the decline in the American export trade of 1902 and, partially, of 1903. Before we conclude we shall have to inquire into the significance of this retrograde movement, and endeavor to ascertain whether the Old World took alarm too quickly or whether it was reassured too easily. But, first, let us see what are the leading articles sold abroad by the United States.

As in the case of the import trade, we find that the American statisticians have divided exports into several classes — viz: agricultural products, mineral products, forest products, fishery products, manufactured products, and miscellaneous products. I give below[1] the quota of each of these classes in the total export trade, excluding only the fishery and miscellaneous products from statistical presentation, the exports of both never amounting to more than $10,000,000, or not over 1 per cent of the total value of the American export trade:

[1] According to the statistics contained in the monthly summaries of finance and commerce published by the Treasury department of the United States.

EXPORTS OF NATIVE PRODUCTS FROM THE UNITED STATES, 1880 TO 1903.

(In millions of dollars.)

	Agricultural products.	Mineral products.	Forest products.	Manufactured products.	Total [1]
1880	686	6	17	103	824
1885	530	16	22	147	727
1890	630	23	29	151	845
1895	553	19	29	184	793
1900	836	38	52	434	1,371
1901	944	38	54	412	1,460
1902	851	39	48	404	1,355
1903	873	39	58	408	1,392
	PERCENTAGES.				
1880	83.2	0.7	2.1	12.5	
1885	73	2.2	3	20.2	
1890	74.5	2.6	3.5	17.9	
1895	69.7	2.3	3.6	23.1	
1900	61	2.8	3.8	31.6	
1901	64.6	2.6	3.7	28.2	
1902	62.8	2.9	3.6	29.8	
1903	62.7	2.8	4.1	29.3	

Naturally, agricultural products show greater fluctuations than any others. The amount of wheat, corn, or cotton available for exportation varies greatly — as does the price — according to whether the crop is good or bad in the United States and in the world as a whole. This is why the statistics relative to agricultural exports do not show the scarcely interrupted upward movement discernible in those relative to other exports. But despite annual fluctuations, they make at least two facts very evident. For one thing, they show that during the past quarter of a century there has been a decided increase in the value of the agricultural products sold by the United States to foreign countries — which is the more remarkable since the year 1880 was an exceptionally profitable one for American agriculturists. But for the five years 1879–1883 the annual average value of agricultural exports was only $630,000,000; whereas the an-

[1] The total includes fishery and miscellaneous products.

nual average value for the five years 1899–1903 was $860,000,000. This is an increase of 35 per cent. And, secondly, the statistics show that the upward movement in the agricultural is less pronounced than that manifest in every other branch of the export trade, primacy in this respect being enjoyed by the manufactured products, the export value of which has more than tripled since 1880 and now amounts to 30 per cent of the total export value in place of 15 per cent as was then the case. To be sure, it should be added that 1880 was a particularly poor year for this branch of the export trade, and that the annual average value of manufactured exports was only $120,000,000 for the period of 1879–1883.

We must look at the subject a little more closely and ascertain the elements composing these two important branches of the American export trade, if we wish to arrive at definite conclusions in regard to the past and present and establish useful premises for the future.

The principal exports of agricultural products were in 1903: breadstuffs ($221,000,000), including wheat (114,000,000 bushels worth $88,000,000), wheat flour (20,000,000 barrels worth $74,000,000), corn (75,000,000 bushels worth $40,000,000) and smaller quantities of oats, barley, rye and sundry food preparations; food products ($180,000,000, including a little less than $5,000,000 worth of butter, cheese and condensed milk, the detailed account of this subdivision of the export trade being given in the chapter on the food products industry); cotton (6,938,000 bales worth $312,000,000); animals ($35,000,000, including 400,000 cattle worth $30,000,000), and raw tobacco (358,000,000 pounds worth $35,000,000).

In order that the reader may perceive at a glance the export fluctuations of the three principal products of agricultural origin, I give the following table showing

the annual average value, in millions of dollars and by five year periods, of the exports of each class:

	1878-1882.	1883-1887.	1888-1892.	1893-1897.	1898-1902.	1903.
Cereals	226	163	166	166	270	221
Cotton	200	211	252	205	256	312
Food products	130	103	122	137	185	180

It is worth pointing out that whereas these three classes accounted for almost three-fourths of the country's export trade a quarter of a century ago, they provide today little more than one-half of that trade. This clearly shows the change that has taken place in the economic life of the United States, as a result of which it sells abroad an ever greater variety of products and an ever increasing proportion of manufactured goods.

Returning to the three principal classes of agricultural products we find that in the period 1898–1902 they showed a considerable increase in value after a relative stagnation and, in the case of the cereals and food products, after a positive decrease in value during the intervening period. In 1903, on the other hand, cotton exports alone showed a value increase, both of the other classes, but especially the cereals, showing a falling off. It would be unwise, however, to conclude from this that the cereal export trade, after a phenomenal rise during the preceding period — a rise partly due to the exceptionally good crops of that period — has reached its limit of expansion and will henceforth remain stationary or decline. The same conclusion could be reached by comparing the statistics relative to this trade for the late seventies and early eighties with those relative to it for the mid and late eighties and early nineties. But this conclusion would nevertheless be radically erroneous. The decline in the value of the cereal exports — from a maximum of $334,000,000 in 1898 to $221,000,000 in 1903 — is, in reality, largely due to a decided fall (22

per cent at New York) in the price of wheat during the intervening period; and to the poor corn crop of 1901, the baneful influences of which were still felt during the early months of the fiscal year 1903 and even throughout the fiscal year, owing to the necessity under which the country lay of replenishing its supply. Viewing not the value but the amount, it will be found that the annual exportation of wheat (including the amount of flour exported) averaged for the period 1898–1902 not less than 200,000,000 bushels, as against an anual average of 150,000,000 bushels for the period 1878–1882. In 1903 209,000,000 bushels of wheat were exported. The exports of 1898, however, were more than this, aggregating fully 240,000,000 bushels. In the case of corn, the annual average was 170,000,000 bushels for the period 1898–1902 as against 85,000,000 bushels for the period 1878–1882. In 1903 only 75,000,000 bushels and in 1902 only 27,000,000 bushels were exported, whereas in 1898 and again in 1900 not less than 209,000,000 were sold abroad. This remarkable decline was due, as I have said, solely to the failure of the crop of 1901. There is hardly room for doubt that an increase will soon follow.

In conclusion, it seems likely that, allowance being made for annual fluctuations due to crop conditions, the wheat exports of the United States will remain at their present high level for a long time to come. In view of the rate at which the population of the country is increasing, it is hardly possible however, to believe that this branch of the export trade will show much progress. So far as concerns the export trade in food products, there is reason to expect not merely that it will maintain its present position but will show a positive advance. The slight decline of 1903 can be safely set down to the failure of the corn crop of 1901, corn, as I have said elsewhere, being a staple fodder in the United States.

The export trade in cotton, finally, has steadily grown both in amount and in value. From 1878 to 1882, cotton exports annually averaged 1,800,000,000 pounds; from 1898 to 1902 fully 3,500,000,000, almost a two-fold increase over the average of twenty years earlier. During the fiscal year 1903 the amount of cotton exported — 3,522,000,000 pounds — was not much above the average for the period of 1898—1902, but the value of the exports of 1903 was decidedly above the average annual value for the same period, the result of the remarkable rise in prices. The proportion of exports to the total crop has varied but little for a quarter of a century. The maximum, 71.2 per cent, was reached in 1878 and 1894; the minimum, 62.9 per cent, in 1901. The period 1878–1882 showed an average of 68 per cent; the period 1898–1902, an average of 65 per cent. Thus there is a slight, but a very slight, downward tendency. Nevertheless, the demand for cotton is increasing so rapidly that it may well be questioned whether the United States can much longer supply the entire world. But whether it can or no, certain it is that, in view of this widespread increase in consumption, it has nothing to fear from the competition of the plantations now being established, or projected for establishment, in the tropical zone. And no matter how the production of the United States may increase, American cotton will always find a ready market. That the production can be increased is unquestionable. All in all, therefore, this branch of the export trade of the United States promises to have a brilliant future.

Among the remaining exports of agricultural origin, the exportation of animals shows a surprising development. From barely $16,000,000 in 1880 and $15,000,000 in 1885, it rose to $34,000,000 in 1890, $36,000,000 in 1895, $43,500,000 in 1900 and $52,000,000. Since then, however, it has fallen to $45,000,000 in 1902 and

$35,000,000 in 1903, the decline being largely due, it would seem, to the corn crop failure of 1901. It is altogether probable that an increase will soon be seen again.[1] But whether this increase will amount to a great deal is more difficult to say. The country's live-stock are only very slowly becoming more numerous. And, more important still, the improvements in refrigerating and other preserving processes should be prejudicial to the exportation of meat on the hoof — an undertaking always attended by risk on account of the losses which may result if the journey is prolonged.

The leaf tobacco export trade has made relatively slow progress during the past twenty-five years. From $25,000,000 in 1875 the value of the annual exports of this commodity fell to $16,000,000 in 1880, rose to $22,000,000 in 1885, fell once more to $21,500,000 in 1890, and then rose anew to $26,000,000 in 1895. Continuing to rise, they touched $29,500,000 in 1900, declined to $27,000,000 for the two following years, and then advanced sharply to $35,000,000 in 1903. A large portion of the territory of the United States is admirably adapted to the growth of tobacco, so that there is nothing surprising in finding the export trade increase.

To sum up: Everything warrants the belief that — allowance, of course, being made for crop variations — the increase observable in the export trade in agricultural products for the past quarter of a century will continue, but not so rapidly as has been the case. It is also probable that although agricultural products will unquestionably continue long to form the greater proportion of the export trade, their predominance will become less and less marked as time passes; while, on the other hand, the proportion of manufactured products will increase.

The rapidity with which this last branch of the export

[1] During the fiscal year ending June 30, 1904, nearly $48,000,000 worth of animals were exported from the United States. H. A. B.

trade has grown of late years has already been shown. Until 1890, when a high level mark of $151,000,000 was touched, the amount of manufactured goods annually exported had never exceeded $150,000,000 in value. Since then this sum has been a minimum. In 1891 the value was $169,000,000, and although the next two years showed a slight falling off, the crisis of 1893 proved remarkably stimulating inasmuch as it diminished home consumption and compelled the manufacturers to seek a market abroad. It is important to observe that at first the goods exported were sold at low prices, the main object being to prevent accumulation of stocks and to keep the factories going. But American-made wares soon became popular in foreign countries and what had originated as a temporary expedient quickly developed into a regular branch of trade. The high prices obtaining in Europe from 1897 to 1900 — prices at the same time being low in the United States — of course favored rapid growth, and from a value of $183,000,000 in 1894 and 1895, the export trade in manufactured products leaped to a value of $434,000,000 in 1900.

About this time there came a change in the economic situation. In the United States, returning prosperity raised prices, wages and consumption; in the Old World there developed a crisis which lowered prices and in many sections reduced wages. It was now the turn of the European manufacturer, and especially the manufacturer of Germany, to seek a foreign market and to endeavor to unload surplus products at almost any price. In face of a heavy home demand the American manufacturers, while increasing their output, began to neglect their export trade which they realized could not be profitable so long as the embarrassment of their foreign customers continued, an embarrassment which was so pronounced in certain countries that the home production was far in excess of the home consumption. For this

reason the value of the American export trade in manufactured goods fell from $434,000,000 in 1900 to $412,000,000 in 1901, and to $404,000,000 in 1902, rising slightly to $408,000,000 in 1903. The surprising thing is not that it should show a decline, but that despite the extremely unfavorable conditions the decline should be so slight. Under the circumstances it is only reasonable to expect that when conditions change again, as change they must, a remarkable expansion of the American export trade will ensue. We may then have the true "American invasion" of which the invasion of 1899 and 1900 was but a faint foreshadowing. It will never do, however, to become panic-stricken at the prospect, or to take fright too soon.

Let us now glance for a moment at the different articles which the Americans export under the generic designation of "manufactured products." Some of these, to tell the truth, scarcely deserve to be thus designated and might more correctly be termed "semi-manufactures." It is thus with one of the most important — copper — the value of the annual exports of which rose from $800,000 in 1880 to $58,000,000 in 1900. Since then it has declined to $43,000,000 in 1901, $41,000,000 in 1902 and $39,667,000 in 1903, a result, chiefly, of the exceptional fall in the price of the metal. The $39,667,000 worth exported during the last-named fiscal year included $2,313,000 worth of worked articles really entitled to be called manufactures, and $37,354,000 worth of copper in ingots, bars and plates. The European producing countries classify such among "raw materials," and it is obvious that copper in these forms cannot, strictly speaking, be termed "manufactured." Similar reservations must be made in regard to the exports of leather and leather goods. Nor can the designation "manufactured" be properly applied to refined mineral oils, the value of the annual exports of which rose from

$30,000,000 in 1880 to $68,000,000 in 1900 and was $60,000,000 in 1903. The changes effected by manufactured processes are very slight, and it would perhaps be better to classify these with crude petroleum (of which $6,000,000 worth was exported in 1900) in the "mineral products" group, which should also include unworked metals like copper ingots, etc.

Deducting the value of the exports of copper and mineral oils there remains for 1903 a total of $309,000,000 worth of manufactured exports as against a total of $307,000,000 for 1900. And not only did 1903 witness a greater exportation of manufactured products than 1900; it was a record year. In 1890 the value of such exports was only $104,000,000, and in 1880 merely $68,000,000. Thus, even greater progress is found than was apparent from the examination of the manufactured exports as classified by the American statisticians. Taking the classification which I believe to be more correct, let us survey the principal products and endeavor to ascertain whether as exports they tend to advance or recede. For this purpose the following table will be of assistance:

PRINCIPAL EXPORTS OF MANUFACTURED PRODUCTS FROM 1880 TO 1903.
(In millions of dollars.)

	1880.	1890.	1895.	1900.	1901.	1902.	1903.
Articles of iron and steel	15	26	32	122	117	98	96
Agricultural machinery	2	4	5	16	16	16	21
Articles of wood	4	6	6	11	11	11	13
Chemical products	4	5	7	12	13	12	13
Leather goods	7	12	16	27	28	30	32
Cotton yarn and cloth	10	10	14	24	20	32	32
Paraffin and paraffin wax	0.4	2	4	9	7	9	9
Paper, and manufactures of	1	1	2	6	7	7	7

These eight classes account for about three-fourths of the total export trade in manufactured products. Europe is, of course, chiefly interested in the iron and steel products, and it is precisely these which afford the best

index to the remarkable growth of the American export trade from 1895 to 1900 and its decline from 1900 to 1903. Moreover, one will readily appreciate the revolution wrought in the iron and steel world by the development of the American iron and steel manufacture if he observe that despite the conditions prevailing in Europe during the opening years of the twentieth century the American iron and steel exports were far in excess of the imports, which in 1902 had a value of only $27,000,000 and which, between 1894 and 1902, had fluctuated between $12,000,000 and $27,000,000. Previous to 1894 the imports had always been greatly in excess of the exports, which until 1889 had never had an annual value of more than $30,000,000. Hasty generalizations from the recent slight decline should, therefore, be carefully guarded against. The United States has become and will remain a colossal exporter of iron and steel, and in this respect is altogether likely to gain, not lose, in the future. It is quite true that German manufacturers are today in a position to undersell their American competitors. But it must be remembered that in accordance with the tendency of wages to be governed by prices the rate of wages in Germany is a crisis rate, whereas in America "good times" wages are being paid. Should even a slight economic depression intervene, both the American rate of wages and the American power of consumption will decline, and Germany, in common with the rest of Europe, will at once be face to face with the most strenuous competition.

The United States is likewise beginning to export cotton goods in enormous quantities and may be expected to become a formidable competitor, not so much in Europe as in the new countries and particularly in the Far East, where cheap yarns and cloths of Southern manufacture are constantly growing in favor. It is worth observing that while manufactured products ac-

count for but 30 per cent of the trade of the United States with the outside world as a whole, they account for 60 per cent of its trade with Asia, which, as is well known, is at last bestirring itself after its prolonged lethargy. This explains the interest manifested by the great republic in all phases of the Far Eastern question. South America, too, hitherto very much neglected, will with the cutting of the Panama canal, become an excellent market for American goods, which will then be in a position to compete with European products in that part of the world. In a word, there can be no doubt that the manufacturers of Europe will, within a very few years, be hard pressed both in their domestic and their foreign markets.

CHAPTER III

THE AMERICAN MERCHANT MARINE.

The exports and imports of the United States are shipped from and to that country almost entirely by sea, only 6 per cent of the latter and 9 per cent of the former being transported by land. There is nothing surprising in this when we remember that its only neighbors — Canada and Mexico — still rate comparatively low in point of production and consumption, and that they necessarily play a quite secondary role in the republic's foreign trade. Of late years there has annually been conveyed by sea between the United States and the rest of the world more than $2,000,000,000 worth of merchandise.[1] Besides which, more than 500,000 passengers annually debark at and some 300,000 annually embark from American ports. All of this necessitates a shipping movement surpassed only by that of the British Isles. In 1902 the tonnage of vessels arriving at American from foreign ports amounted to 24,361,000 tons; that of vessels leaving American for foreign ports, 24,202,000 tons. The total tonnage entered and cleared was thus more than 48,500,000 tons. In Great Britain the corresponding total for the year 1900 was almost 100,000,000 tons, and for 1898, the last normal year before the South African War, 90,000,000 tons. The

[1] During the year 1902 there was imported into the United States by water $847,000,000 worth of merchandise, and $56,000,000 worth by land. In the same year the United States exported $1,258,000,000 worth by water and $124,000,000 worth by land. Even in shipping goods to and from Canada or Mexico, water routes are largely used. On the other hand, some exports and imports of trans-oceanic passage, are shipped into and out of the United States by rail, via Canadian seaports.

annual tonnage of foreign trade vessels entering and leaving French ports is about 18,000,000 tons.

But the entries from and departures for foreign ports represent only a portion of American navigation. On the Atlantic side there is an extremely extensive coastwise traffic in the heavy commodities produced so abundantly and consumed so freely in that region. For example, coasters are engaged in carrying to New England from Virginia or Pennsylvania the coal required by the people of New England either for manufacturing or domestic purposes. Similarly, lumber is shipped by water from the South and from the North-East to New York and the other great cities along the coast; and cotton from its centres of production in the South to the mills of Massachusetts, Rhode Island and Connecticut. Finally, throughout the summer palatial steamers running between New York and Newport — The American Trouville or Dinard — carry a host of passengers who prefer to pass the night, in a good bed, on the calm waters of Long Island Sound rather than to be shaken about for five hours in a railway car.

Complete statistics relative to the coastwise trade of the United States are not obtainable. But the monthly summaries of commerce and finance, published at Washington by the Treasury Department, inform us that during the first six months of 1903 there entered at the port of Boston 4,498 vessels of 3,901,000 tonnage engaged in the coastwise trade, as against 792 vessels of 1,505,000 tonnage engaged in foreign trade. During the same period there entered at New York 3,779 vessels of the former class and 2,145 of the latter; and at Philadelphia 1,793 of the former, 637 of the latter. It is impossible, however, to give the tonnage of these entries. During the first six months of the same year 12,000,000 tons of coal were shipped by water from New York, Philadelphia, Baltimore and Newport News for other points on

the coast, but chiefly for New England ports. During the same period, coasting vessels brought 200,000,000 feet of lumber to New York from various Southern states. Fragmentary as are these facts, they will suffice to give an idea of the coastwise trade of the Atlantic seaboard. There is less coastwise traffic in the Gulf of Mexico, but even there we find a considerable movement in cotton and petroleum. And the case is identical in respect to the Pacific coast, where if there is least activity in coastwise navigation it still amounts to some millions of tons. The coastwise tonnage of France, I would remind my readers, is not more than 8,000,000 tons in all, and that of the British Isles, including both entries and departures, 60,000,000 tons.

Even now a full account of the navigation of the United States has not been rendered. We have still to consider the shipping of the Great Lakes, those enormous expanses of water which are of such significance to the economic life of America and which have so contributed to the industrial development of the United States by facilitating the transportation of coal and ores — to say nothing of grains and sundry merchandise — at exceedingly low rates. During the first nine months of 1903 not less than 60,000 vessels, with an aggregate tonnage of 56,000,000 tons entered the various lake ports and as many more, of an equal tonnage, cleared from them. In 1902 a tonnage of more than 31,955,000 tons passed through the Sault Ste. Marie canal, which is the connecting link between Lake Superior and Lake Huron, and which is particularly valuable as affording a water route for the transshipment of the iron ores of that region, but through which, needless to say, by no means all the commerce of the Great Lakes passes. Of late years the port of Chicago alone has annually received by water not less than 8,000,000 tons of freight.

In being practiced over immense, deep and frequently

storm-swept bodies of water, in the distances traversed and in the types and dimensions of the vessels employed, Great Lakes navigation is fairly comparable with coastwise, even with ocean navigation. That is the reason it cannot be ignored in studying the maritime affairs of the United States. Moreover, it has been proposed to improve the means of communication between the lakes and the lower St. Lawrence so as to permit the entrance of ocean-going steamers which at present cannot navigate the river beyond Montreal, but which would then be able to load and unload at Duluth, at Cleveland, at Chicago, or at any other of the large cities situated on the shores of the lakes. If this proposal were put into effect it would at once bring about an immediate expansion in the export trade in grains and metal products. Nor is it improbable, or at any rate impossible, that such a project will some day be realized.

River and canal navigation, which is especially active on the Ohio and Monongahela rivers and the New York state canals, is quite different from the Great Lakes navigation, being much more similar to the inland navigation with which we are familiar. Still, the length and width of the Mississippi and of the lower courses of some of its tributaries, are such as to permit the employment of enormous steamboats drawing much more water and carrying a much greater tonnage than the vessels navigating the largest rivers of Europe. But the Mississippi river steamboats no longer possess the economic importance which was theirs from 1830 to 1850 and even to 1860, before the railway invaded their territory. In those early times they were potent instruments in the development of the West; today they play but a secondary role, the greater speed, regularity and safety offered by the railway drawing trade from them to such an extent that their patronage is now confined to cities and

towns along the river, the navigation of which is not always free from danger.

Having glanced at the navigation of the United States as a whole, let us now return to that phase which is — to European readers, at any rate — unquestionably the most interesting. I refer, of course, to the movement between the United States and foreign countries. And, first, let us examine the following table:

TONNAGE OF VESSELS ENTERED AND CLEARED AT AMERICAN SEAPORTS.
(In thousands of tons.)

	Entered.			Cleared.		
	Steamships.	Sailing vessels.	Total.	Steamships.	Sailing vessels.	Total.
1882.....	8,520	6,136	14,656	8,648	6,198	14,846
1892.....	13,708	4,472	18,180	13,850	4,408	18,258
1902.....	21,416	2,945	24,361	21,318	2,924	24,242

The increase, corresponding to the expansion of the country's foreign trade, has been rapid. In response to various economic influences, however, it has been very unevenly distributed among the different ports, as the following table, which refers only to the entries and departures of vessels engaged in the ocean-carrying trade, makes very evident:

TONNAGE ENTERED AND CLEARED AT PRINCIPAL SEAPORTS.
(In thousands of tons.)

	1882.		1902.	
Atlantic ports:	Entered.	Cleared.	Entered.	Cleared.
Portland	177	236	387	385
Boston	1,416	1,305	2,411	2,088
New York	7,361	7,263	8,983	8,415
Philadelphia	1,056	969	1,926	1,945
Baltimore	853	803	1,410	1,353
Newport News	14	93	426	500
Norfolk	52	137	84	424
Savannah	131	162	224	352
Gulf of Mexico ports:				
Pensacola	289	347	428	483
Mobile	59	69	495	488
New Orleans	620	661	1,702	1,907
Galveston	143	116	637	750
Pacific ports:				
San Francisco	1,116	1,200	1,016	1,181
Puget Sound	218	230	1,222	1,341

One of the most interesting facts revealed by this table is that New York, which twenty years ago was the port of entry and departure for about one-half of the vessels engaged in foreign trade is today the port of entry and departure for little more than one-third of such vessels. In other words, the premier port of the United States is showing relatively slower progress than the others. But there are several good reasons why such should be the case. For one thing, the territory finding its natural outlet at New York was, in 1880, already pretty thoroughly developed so that it has expanded comparatively less than the sections — then almost undeveloped — served by other ports. Again, New York was formerly better supplied with means of inland communication than the majority of its rivals; nowadays an expanding railway system has enabled them to obtain no small portion of the trade which had hitherto of necessity gone to New York.

Thus, to give concrete illustrations, the manufacturing growth of New England and Pennsylvania has greatly augmented the shipping business of Boston and Philadelphia; and the opening of new coal mines, to which they have been connected by direct lines of rail, has given a powerful impetus to the Virginian ports of Newport News and Norfolk. Similarly, the development of the South's railway system, the colonization of Kansas, Texas and Oklahoma, and the extension of cotton plantations towards the South-West, have enormously increased the transactions of Galveston and New Orleans, which are nearer almost all points west of the Mississippi than is New York, and which have so prospered not only in the cotton, but in the grain-carrying trade that "Bradstreet's," the well-known commercial journal, felt justified in publishing some little time ago an article on "New York's Lost Grain Export Trade." Finally, the gains shown by the Puget Sound ports (of which

Tacoma and Seattle are the most important) are due, first, to the fact that the state of Washington, which they serve, is today a heavy exporter of wheat and lumber, whereas it was virtually uncolonized twenty-five years ago; secondly, to the discovery of gold in the Klondike and Alaska, for which Seattle is the point of departure; thirdly, to the closer trade relations between the United States and the Far East. It would seem, indeed, that these Puget Sound ports are but at the beginning of a brilliant commercial career, as are the Gulf of Mexico ports for which the construction of the Panama canal holds dazzling prospects.

The country with which the United States has the most active maritime relations is, of course, Great Britain. But it is noteworthy that the shipping between the two countries has not increased in proportion to the increase in the volume of business done by American ports. From 1882 to 1902 the annual tonnage entered from the British Isles has risen only from 5,368,000 to 7,103,000 tons, and the annual tonnage cleared for Great Britain only from 6,453,000 to 7,286,000 tons. Germany, on the other hand, with 2,209,000 tons entered and 2,397,000 tons cleared has, since 1882, almost doubled the volume of her maritime dealings with the United States, Holland, with 801,000 tons entered and 1,136,000 tons cleared (mainly shipments from and to Germany) has more than tripled hers, as (chiefly by reason of the heavy emigration movement) has Italy with 814,000 tons entered and 703,000 tons cleared. Belgium's quota has risen, in the period under review, from 576,000 tons entered and 581,000 tons cleared, to 880,000 tons entered and 926,000 tons cleared. Entries from French ports show small change — 620,000 tons in 1902 as against 605,000 tons in 1882 — and in departures for French ports there has also been but a comparatively slight increase — 977,000 tons in 1902 as against 824,000 tons

in 1882. Here, as in all maritime matters, we cut a sorry figure. If shipments between the United States and European countries have greatly increased, a still more notable increase is apparent in the international coastwise trade between the United States and Canada, Mexico, the West Indies, Central America and South America. The annual tonnage between American ports and points on the Atlantic litoral of Canada has risen from 816,000 tons entered at American ports and 1,009,000 tons cleared at American ports in 1882 to 1,231,000 tons entered and 1,306,000 tons cleared in 1902. Shipments from and to points along the coast of British Columbia, Canada's facade on the Pacific, show much more rapid progress, the figures being 1,423,000 tons entered and 1,405,000 tons cleared in 1902 as against 383,000 tons entered and 389,000 tons cleared twenty years earlier. In the case of Mexico the increase is from 229,000 and 210,000 to 768,000 and 595,000 tons; in that of Cuba from 1,172,000 and 832,000 to 1,707,000 and 1,603,000; in that of the British West Indies from 401,000 and 367,000 to 847,000 and 841,000; in that of the small Central American republics, from 48,000 and 28,000 to 370,000 and 349,000 tons. Thus the United States is making it more and more evident that it exerts a predominating influence over the economic life of the whole of North America, and particularly over the economic life of those countries bordering on the Gulf of Mexico and the Caribbean Sea.

In respect to South America the situation is different, for although the volume of trade between the United States and the various South American countries is increasing, their commercial relations can scarcely be regarded as intimate. It should be pointed out, however, that the Argentine Republic and Brazil (except the Amazon country) are as near to Europe by sea as they are to the United States, and this has, of course, assisted

the manufacturers of the Old World in holding the market won by them at an early day. Chile and Peru are, to be sure, much nearer to California and Oregon than to our part of the world. But the Pacific Coast states are still in an initial stage of industrial development and can neither supply these countries with manufactured goods nor offer them markets for their raw materials. And, pending the completion of the Panama canal, the manufacturing sections of the United States — that is to say, the Eastern states — are no more favorably situated in respect to the Pacific coast countries of South America than is Europe. The American statistics give no information relative to the vessels entering from or clearing for these South-Western republics. They merely inform us that shipments between the United States and Colombia, which in 1882 were at the rate of 262,000 tons entered and 197,000 tons cleared, had risen in 1902 to 369,000 tons entered and 330,000 tons cleared; that the increase in the case of Brazil was from 380,000 and 195,000 tons to 616,000 and 250,000 tons; and that in the case of the Argentine Republic it was from 42,000 and 64,000 tons to 147,000 and 264,000 tons. These figures do not indicate any very heavy volume of trade, and if Europe is on the alert she will doubtless for a long time to come continue to enjoy primacy in the foreign trade of these countries.

It is another story when we turn to the Far East. There the United States possesses a distinct geographical advantage, and accordingly it is not surprising to find that the shipments between that country and China, Japan and Hong Kong have risen from 252,000 tons entered and 203,000 tons cleared in 1882 to 751,000 tons entered and 721,000 tons cleared in 1902. Upon the opening of the Panama canal, which will so greatly facilitate dealings between Eastern Asia on the one hand and New York and, still more, New Orleans on the other,

and which will vastly augment the natural advantages enjoyed by the United States, Europe will be hard put to maintain her position in the Yellow Markets. How difficult it will be for her to do so may be judged from the fact that from 1893 to 1902 the export trade of the United States with China, Japan and Hong Kong passed from $11,000,000 to $53,000,000, an almost five-fold increase; while the import trade of the United States with the same countries and for the same period did not quite double.

Informative as are the tonnage statistics of which we have just been availing ourselves, they afford us no idea of the apportionment of the ocean-carrying trade of the United States among the merchant marine of the different countries, for, as is well known, many countries are largely dependent on foreign carriers. However, statistics on this point are not lacking, and I am therefore able to present the following table showing how the tonnage entering American ports during the years 1882, 1892 and 1902 was distributed among the principal carrying countries. I give only the tonnage entered for the reason that the tonnage cleared does not vary from the other by more than 2 or 3 per cent:

NATIONALITY OF TONNAGE ENTERED AT AMERICAN SEAPORTS.

(In thousands of tons.)

Flag.	1882.	1892.	1902.
American	2,968	3,747	4,020
British	7,680	9,820	12,368
German	1,252	1,606	2,797
Swedish and Norwegian	830	1,019	1,647
Dutch	157	371	669
Spanish	261	313	567
French	376	375	554
Italian	435	304	523
Belgian	327	299	329
Danish	69	82	313

Vessels flying other flags (Austrian, Russian, Portuguese, Japanese, etc.,) carried, in 1902, less than 150,000

tons each. The total tonnage entered at the various seaports during that year was, as has been said, 24,361,000 tons.

The greatest gains are shown by the merchant marine of Germany, Norway and Great Britain and — among secondary carrying countries — Holland and Spain. The increase in the case of the last named is explained by the cession of Porto Rico to the United States, Spain continuing to maintain commercial relations with her former colony. No explanation is necessary in regard to Germany, Holland and Norway, for everybody is acquainted with the facts of their recent remarkable maritime development. As to Great Britain, it is sufficient to say that the increase indicates that England is maintaining her ancient supremacy better in this than in any other sphere of her economic activities.

Looking at the matter more closely, we find that German lines are coming more and more to the front in the high-speed passenger and freight traffic between Europe and New York. The gigantic vessels used by them have done much to swell the German tonnage entering American ports. Their largest steamer, the Deutschland, which is of 16,000 tons gross tonnage, and is equipped with machinery of 37,500 horsepower, holds the trans-Atlantic speed record having made the passage from New York to Plymouth in five days, seven hours and thirty-seven minutes (September, 1900,) and that from Cherbourg to New York in five days, eleven hours and fifty-four minutes (September, 1903).[1] On the other hand, unfortunately, French lines have shown hardly any progress, and are dropping further and further behind their rivals in point of speed, a factor of no small influence in securing business in such a land of "rec-

[1] The Lucania of the Cunard line, (Great Britain) in 1894 made the passage between Queenstown and New York in five days, seven hours and twenty-three minutes. But New York is only 2,800 miles distant from Queenstown, whereas it is 2,962 miles from Plymouth, 3,084 miles from Cherbourg and 3,170 miles from Havre.

ords" as is the United States. The best of our ocean liners, La Lorraine and La Savoie, have never succeeded in making the passage from Havre to New York in less than six days and nine hours. It is unnecessary to enter into any explanation of the causes of our inferiority in things maritime.

Returning to the table of tonnage nationality, the most striking fact in evidence is the comparatively small share of business going to American vessels. To be sure, observers find that in the ports of almost all countries the national flag is seen less frequently than foreign flags, England being the most noteworthy exception to this general rule. In Germany, as in Norway and Sweden, the carrying trade is divided in about equal proportions between the national merchant marine and the merchant marine of foreign countries. Foreign vessels claim two-thirds of the carrying trade of France, three-fourths of that of Italy, and more than four-fifths (83 per cent, to be exact) of that of the United States. It is only fair to say, however, that in the case of the last named this is not due to the weakness of the native merchant marine so much as to the extreme commercial activity of the country, an activity much more intense than is to be found in any continental country of Europe.

As a matter of fact, even excluding the vessels that navigate the Great Lakes, the Mississippi and its tributaries and other lakes and rivers, the commercial flotilla of the United States ranks third among the mercantile navies of the world, being surpassed only by the merchant marine of Great Britain and Germany, and being markedly superior to that of France. There was a time, to be sure, when it was more favorably situated than it is today. This was about the middle of the nineteenth century, when it even threatened the supremacy of the British merchant marine. In 1861, its "record" year, its total tonnage was 5,500,000 tons, of which 2,500,000

tons represented the tonnage of the vessels engaged in foreign trade, 2,700,000 that of the vessels engaged in coastwise trade, and 340,000 tons that of its whaling and deep-sea fishing fleet. The timber wealth of the United States and the ease with which this timber could be brought to the Atlantic seaboard, were important factors in making this splendid showing possible.

With the Civil War shipbuilding was at once arrested. The powerful Southern corsairs, led by the famous Alabama, pursued the Northern merchantman on every sea. In 1868 the American merchant marine had an aggregate tonnage of a scant 4,300,000 tons, of which 1,500,000 tons represented the total tonnage of the vessels engaged in foreign trade. And in the interim the art of shipbuilding had been revolutionized. Steamships were beginning to take the place of sailing ships, and vessels were no longer built of wood but of iron. Unfortunately for the United States, it at that time produced very little iron, and what little it did was very costly. England, on the other hand, was mistress of the iron industry, so that all the advantage remained with her. As a result the American merchant marine ceased to progress, and after a time the Stars and Stripes were seen less and less frequently in distant waters. In 1881, when the lowest point was touched, the total tonnage was but 4,000,000 tons, including only 1,300,000 tons of vessels of foreign trade, this latter total in turn including but 153,000 tons of steamship tonnage. Since then the foreign trade tonnage has decreased still more. In 1888 it was only 919,000 tons, with 179,000 tons of steamship tonnage. This was undoubtedly the year when the capacity of the foreign trade flotilla was at its lowest, for if the total tonnage has decreased somewhat since then, the steamship tonnage has increased, and the utility of a steamer of a given tonnage may fairly be estimated as

equivalent to that of four sailing vessels of a like tonnage.

The following table will give an idea of the ups and downs of the American merchant marine during the twenty years 1882–1902:

TONNAGE OF THE AMERICAN MERCHANT MARINE.
(In thousands of tons.)

	Foreign trade.		Coast trade.		Total (including deep-sea fishing fleet.)
	Steamships.	All vessels.	Steamships.	All vessels.	
1882.....	154	1,259	1,201	2,795	4,165
1892.....	225	978	1,846	3,701	4,764
1902.....	455	873	2,718	4,858	5,797

Thus, in 1902 the total tonnage was for the first time superior to that of 1861. The "coastwise" figures, it should be pointed out, include the tonnage of the vessels engaged in Great Lakes and Western river navigation. The importance of these inland fleets may be gauged from the following table, which shows the distribution of the American merchant marine for the year 1901, the latest year for which full statistics are available at the moment of writing:

MERCHANT MARINE OF THE UNITED STATES.
(Tonnage in thousands of tons.)

	Steamships.		Sailing vessels.	
	Number.	Tonnage.	Number.	Tonnage.
Atlantic and Gulf	11,309	1,247	3,544	1,175
Pacific	995	319	920	325
Great Lakes	784	332	1,778	1,243
Western rivers	82	2	1,144	168
Hawaii	39	28	25	9
Porto Rico	22	5	3	0.3
Total	13,231	1,933	7,414	2,920

	Canal boats.		Total vessels.	
	Number.	Tonnage.	Number.	Tonnage.
Atlantic and Gulf.....	1,891	427	16,744	2,849
Pacific	472	32	2,387	677
Great Lakes	691	130	3,253	1,706
Western rivers	358	80	1,584	249
Hawaii	....	...	64	37
Porto Rico	....	...	25	5
Total	3,412	670	24,057	5,524

To-day the tonnage of the seaboard and Great Lakes vessels — at least in respect to steamships — is rapidly increasing. That of the Western river vessels, on the contrary, has decreased 30 per cent during twenty years.

Shipbuilding, so long stagnant, has become active once more, especially since 1900. The statistics relative to the number and tonnage of vessels recently constructed give ample evidence that the situation has greatly changed for the better:

VESSELS BUILT IN THE UNITED STATES IN 1900, 1901 AND 1902.
(Tonnage in thousands of tons.)

	Number.	Tonnage.	Number.	Tonnage.	Number.	Tonnage.
1900.....	1,107	249	125	130	1,447	393
1901.....	1,094	291	175	169	1,580	483
1902.....	1,197	290	133	169	1,491	469

The total, it should be explained, includes the vessels constructed on Western rivers. Their tonnage was 14,173 tons in 1900, 22,888 in 1901 and 9,836 in 1902.

Until 1900 the tonnage of the vessels annually constructed in the United States was only once (in 1891) in excess of 300,000 tons, and it was generally below 250,000 tons. Decidedly, the past few years have been years of progress. This fact becomes still more apparent when it is observed that the vessels launched in 1902 included steamships having a total tonnage of 308,000 tons, the remaining tonnage being composed of 97,000 tons in sailing vessels and 64,000 tons in canal boats and barges. Nor, in view of the development of the iron and steel industry, can it be doubted that the United States will soon be as favorably situated in respect to shipbuilding facilities as in the days when vessels were built of wood. Why, then, should not the shipyards of Philadelphia and other American cities before long rival those of the Tyne and the Clyde? The Americans are not the sort of people to permit the trans-

portation of nine-tenths of their foreign trade in foreign bottoms, so soon as they see their way clear to make a change. Consequently, in shipping, as in so much else, Europe is destined to meet the lively competition of America.

It will doubtless take the United States a good many years to regain its old position, for the shipbuilding industry is one of those which develops slowly. But the Americans can be trusted to undertake the task with their customary energy and enterprise, and they will surely succeed. In addition to the famous "shipping trust," which has so unduly alarmed Europe, they are even now engaging in some interesting enterprises. Impelled by their innate tendency to concentration and combination, they are seeking to unite railway operation with that of steamship lines, deeming navigation but an extension of land transportation. For example, J. J. Hill, the railroad king of the North-West, is building some immense vessels to bear across the Pacific merchandise transported overland by his "Great Northern" railway. He claims that he will be able to charge very low rates, because at the present time almost all the heavy traffic of his road is from west to east. But once a direct transportation system is established between Chicago or Pittsburg and Japan, via the rails and steamships of the "Great Northern," a return freight will be created, and consequently however low the rate it will be that much of a profit.

Perhaps the greatest obstacle in the way of the growth of the American merchant marine is the difficulty of securing sailors, a difficulty also experienced in England. But mechanical improvements and the increasing use of steam have diminished equipment requirements, and a large portion of the modern crew consists of engineers, firemen and kindred workmen whose tasks differ scarcely at all from those they are accustomed to perform on

land. So that we are perfectly justified in believing that the United States will eventually regain its old-time prominence among maritime nations. The day — doubtless still far distant — when it does regain it, will mark the extension of its economic influence over a very large portion of the world, if not over the entire world.